Pit and Quarry

SAND ▪ GRAVEL ▪ STONE

HANDLING ▪ CRUSHING ▪ SCREENING ▪ WASHING

III 9

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Pioneer Excavating Outfits 1919

Are recognized the world over as representing the highest type of slack line sand and gravel excavating machinery.

The Pioneer outfit is simple, efficient, inexpensive. It operates equally well in wet or dry pits. One man operates a Pioneer plant.

We have just published a new booklet on slack line excavation which will be of interest to you as a sand and gravel producer. *Your* copy is ready to mail. Just say the word, and receive booklet 73 with our compliments.

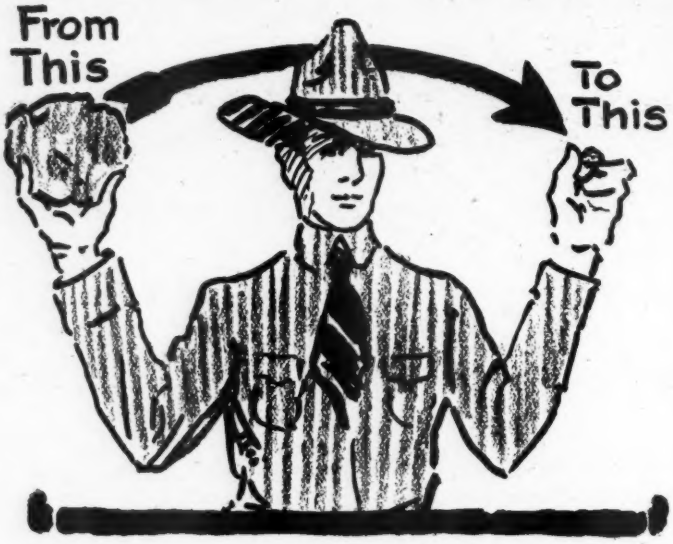
The Mansfield Engineering Co.

Designers and Builders of Complete Gravel Plants

Indianapolis Indiana

JUNE, 1919

Table of Contents - - - - - Page 29
Index to Advertisers - - - - Page 29



IN ONE OPERATION

A crusher that will take the rejection, screened or unscreened, from large standard gyratory crushers and effect a reduction to ¾-inch or less, rapidly and at one operation is, you will concede, a remarkably valuable outfit of its kind. That's what

THE SYMONS DISC CRUSHER

will do. Furthermore, it spreads the rock while crushing, thereby avoiding congestion, choking, and unnecessary wear. It is equipped with manganese steel crushing members.

It sustains the main crushing load on a large ball and socket bearing having little movement.

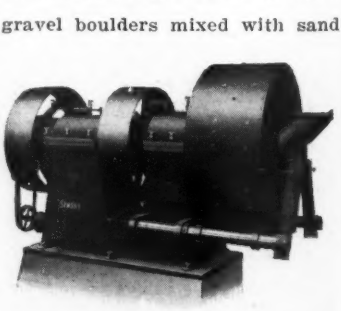
It employs centrifugal force to feed through the material and fling out the product, which it does the instant it is reduced to proper size.

It can be quickly adjusted to make any standard size of product down to ⅜ inch, if desired.

It successfully reduces wet or dry gravel boulders mixed with sand to smaller product.

It excels in economy of power, in uniformity of product and in low repair cost.

It is built in four sizes.



Write for descriptive Booklet R.

Chalmers & Williams
1430 Arnold Street
Chicago Heights, Ill.

Pit and Quarry

Vol. 3 Chicago, Ill., June, 1919 No. 9

Lengthen the Season for Agricultural Lime

WHY should the production of agricultural lime be restricted to a few months of the year? Of course, everybody thinks he knows the answer: Because it is only during those months that the farmer buys it, and it is impossible to store large quantities of such material against the time of future need.

But this reply is perhaps subject to modification in both directions. Some producers are beginning to believe it possible and economically feasible to provide storage space for a considerable quantity of this material, so that the production can be distributed over a longer period and the peak load will not be so heavy at the height of the season.

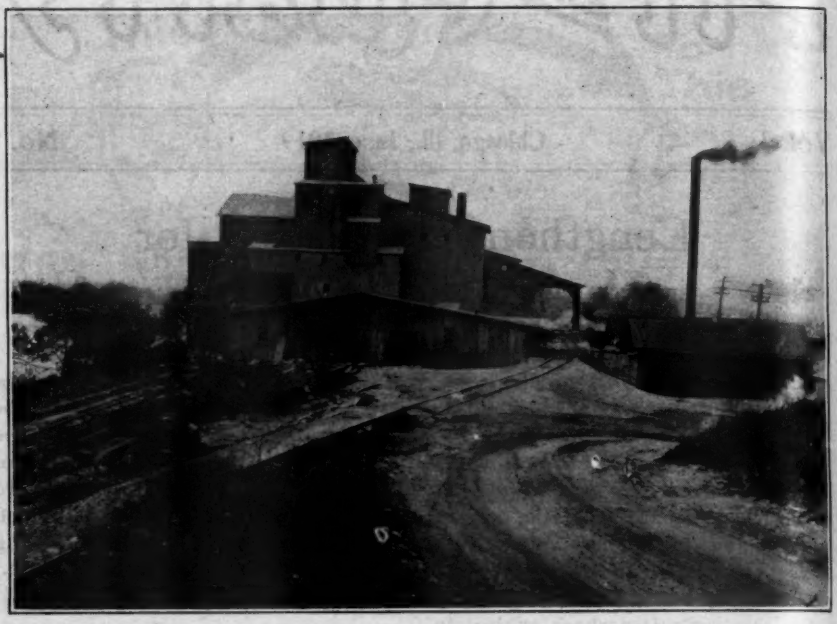
On the other hand it may be that the farmer can be educated to spread out his buying over a longer time also. It would seem on the face of it that he would much rather take out a small quantity of lime on occasional trips to town, than make a special job of it at a time when he might be using his time to better advantage at other things. But in order to encourage this method of distribution, the lime will necessarily have to be furnished in sacks; and this introduces a new element of cost, whereas the farmer will naturally expect a decrease in price if he is to be induced to invest his money ahead of his actual needs.

If, however, the distribution can be so adjusted that production can be kept up for a considerable portion of the year, there will be a downward tendency of production cost which will soon be reflected in the selling price.

Local dealers will find it advantageous in many cases, also, to provide larger storage facilities for agricultural lime; but the local dealer in any commodity is not usually inclined to anticipate demands very far in the future, so that his part in the process will come to pass largely through outside pressure and not as a part of a broad-visioned constructive program.

It will be worth while, however, for manufacturers to take such measure as they can to stimulate this kind of dealer co-operation; and if in addition the dealer can be induced to extend to farmers a little more than the usual period of credit on these purchases, when they need it, still further progress will be made.

The railroads should be interested, too, in seeing this business distributed, rather than having it crowded upon them in a short period of time, and would find it to their interest to provide storage facilities themselves at advantageous points.



Lime Plant of Marble Cliff Quarries Company

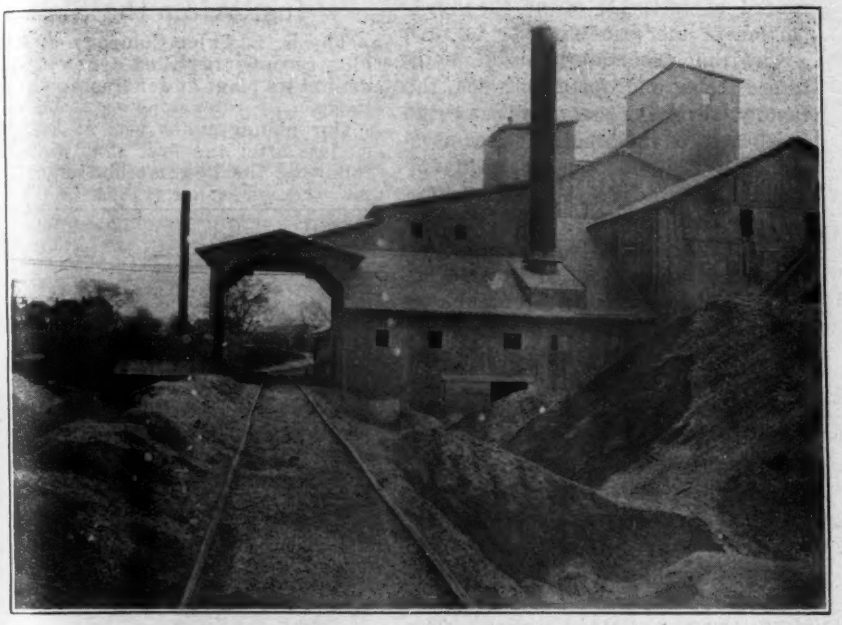
Now Grinding Agricultural Lime

Big Columbus Quarry Company Getting Plant Started for This Product

THE Marble Cliff Quarries Company, operating extensive quarries near Columbus, Ohio, and one of the well known concerns of the state, has recently set in operation a new plant, primarily for the production of agricultural lime, but supplying the market also with a new brand of chicken grit in three sizes, as well as furnishing to the nursery trade and the dealers in garden supplies a special brand of fertilizer for lawns and gardens.

This plant has been installed near the main quarries at Marble Cliff, about four miles from Columbus, and is supplied from the quarries with the same class of raw material as is used for fluxing stone. It can thus be used to a certain extent to take up the slack when the demand for fluxing material is weakest, having as it does an unusually large amount of storage space for both the bulk product and that which has been packed in bags.

The material comes from the crusher plant in size up to about 2 inches, trains of 12-yard Western dump cars being used for this purpose. These normally dump into a pit alongside the track; but if it is desired to accumulate a large stock of raw material at any one time, stock piles are formed on either side of the track by means of a traveling crane with clam-



Rear of Plant, with Storage Pit to the Right

shell bucket, this same equipment feeding the stone back to the pit when it is needed.

Running under the length of the pit is a 24-inch belt conveyor, onto which the stone can be delivered at any desired point merely by opening up a trap in the bottom of the pit. From the belt conveyor the stone is taken by a bucket elevator to a Cummer dryer. This dryer is bricked in and is heated by two furnaces with mechanical stokers. The floor from which the furnaces are fed is on a line with the bottom of the stone pit, so that the coal can be brought in over the same track and dumped through an opening in the side of the building directly onto the floor below.

The installation of the dryer has already proven worth while, because of the increased rapidity with which the dry stone will go through the screens and crushers. These people have been in the business so long that they recognize the value of keeping crushers working up to capacity, and this they are determined to do in this new plant so far as possible; then when the limit is reached they will add more crushers.

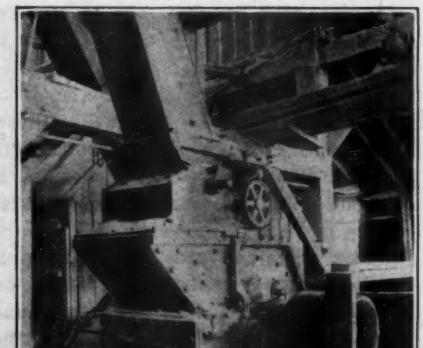
From the dryer the stone goes immediately to the preliminary or "scalping" screens, of which there are two. That which passes these screens goes immediately to the six sizing screens, while the oversize is taken by means of a bucket elevator and 12-inch Jeffrey drag conveyor to the crushers. There are two of these, with space for two more which will be installed as soon as the plant is tuned up to the point where greater grinding capacity is needed.

The machines are Jeffrey Type D swing hammer pulverizers, made especially for reducing limestone and shale, by the Jeffrey Manufacturing Company of Columbus. This type of machine is designed to engage the material on the up stroke of the hammers. Three breaker plates are ar-

ranged at intervals about the upper portion of the grinding case in such a way that the material is violently tossed back and forth between the rapidly revolving hammers and the anvil faces of the breaker plates. Consequently the reduction is mostly by impact, and the degree of reduction varies, for any given material, with the peripheral speed of the hammers. Each machine is supplied with an automatic feeder suitable for regulating the flow of materal from a storage bin. The hammers are of manganese steel, double ended, thus giving four wearing corners. When necessary to replace them, this can easily be done through the door in the front.

From the screens the material goes either to bins for immediate bagging, or by a long belt conveyor back across the mill to the stock house. Bagging of the lime is done by means of a two-bag Bates packer. The chicken grit is bagged by hand from three ordinary overhead chutes.

The plant is entirely motor driven, with individual Allis-Chalmers motors, current being purchased from the Columbus city plant. Rope drives are used almost exclusively throughout the mill, employing 1½-inch manila rope.

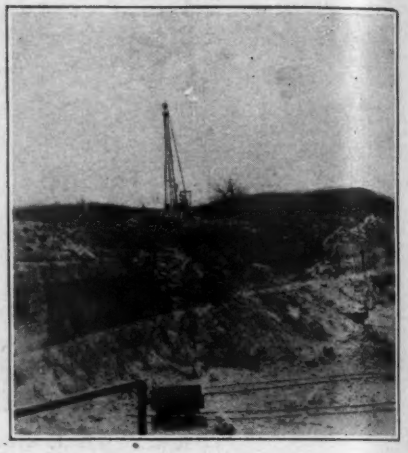


Jeffrey Type D Pulverizer

Just After the Shot

The R. B. Tyler Company of Louisville recently installed a new Cyclone drill at its plant at Jeffersontown, Kentucky.

Our photographer was at the quarry just after the first shot was made following the new method of drilling.



The blast was very successful in that practically all of the stone was thrown down in sufficiently small size to go difect to the crusher without secondary blasting.

An employee injured while working in a quarry, according to an Indiana court decision, is not to be charged with contributory negligence and his action for damages defeated on the ground that he voluntary chose a hazardous way of doing his work when another and a safer way was open to him, where the evidence shows he was doing his work in the usual and customary way and that he was at the time obeying an order of the superintendent, who was present and saw and knew how the work was being done, made no objections thereto, and gave no warning to appellee of danger because of the way he was doing his work.

The Barfield Sand and Material Company, of Blytheville, Ark., G. S. Moore, president, has been incorporated. Capital $75,000 of which $50,000 has been subscribed.

Plan to attend the convention of the Lime Association, June 18 and 19, at Pittsburgh.

Locating the Man You Want

BY V. KARAPETOFF*
Professor of Electrical Engineering,
Cornell University.

NO INDUSTRIAL plant of any magnitude may be considered fully efficient unless means are provided for promptly locating any important employee, no matter where he may be within the plant. A private telephone system, however extensive, serves this purpose only as long as the needed man is at his desk, but as soon as he leaves his desk the problem of locating him becomes a hit or miss proposition. On the other hand a superintendent, a foreman, a repair man, etc., is ordinarily useful only in so far as he can freely move about the shop without the fear that someone of importance may need him. Thus, within the last few years, under the tremendous impetus of the pressure for an enormous increase in the production of munitions of war, audible electric signals have been introduced into many industrial plants.

Such an electric signal is often similar in construction to the familiar electric "horn" used on automobiles. It consists of a diaphragm with an anvil at its center. A toothed wheel driven by a small electric motor strikes the anvil many times a second and causes it to vibrate vigorously. These vibrations produce the well-known warning tone, which carries over a considerable distance. The device is provided with a projector or horn the shape of which depends on whether it is desired to scatter the sound, to intensify it in a horizontal direction, or to deflect it downward.

With such electric audible signals scattered throughout the plant, it becomes an easy matter to locate instantly any person to whom a code number has been assigned. For example, when the manager wishes to speak to one of the assistant superintendents, who may be anywhere in the plant, he simply tells the telephone operator to sound this particular man's call. As soon as this assistant superintendent hears his call, he comes to the nearest telephone and reports, whereupon the operator connects him with the manager.

It would be rather inconvenient for the telephone operator to sound various calls by hand; therefore a special code-calling automatic instrument has been developed for this purpose. The operator merely sets the desired person's code number on a dial and pulls a lever, a contact-making mechanism is thereby set in motion, which closes the electric circuit and operates the code signals throughout the plant the required number of times (usually three times) and then stops automatically.

A further application of loud electric horns in industrial plants is for extensions to telephone bells. The ordinary telephone ringer is not loud enough in many shops when the foreman is away from his desk. In this case, a relay is connected in parallel with or in place of the telephone ringer, and when it is actuated, it closes a secondary circuit which causes an electric horn to sound. This call should be a single blast to distinguish it from code calls.

Audible electric signal systems are also used in various plants as warning signals on cranes and hoists, also to call a shifting locomotive, to indicate the beginning or the end of a certain operation, and for other local purposes. Like in the case of any convenience, once such an electric signal system has been installed, the superintendent, the foremen, and even the operatives themselves will find new uses for it.

Numerous Seams Complicate Drilling

Government Expert Tells How to Make These Shots to Best Advantage

THE presence of irregular seams or pockets filled with clay greatly complicates drilling, because these are often difficult to avoid in placing the holes. Mere avoidance of seams is, however, only part of the problem. The holes may all be in sound rock and yet be so arranged that the blast will be ineffective. In general, it may be stated that in seamy rock each individual mass bounded by open seams should have at least one hole drilled in it, and, if the mass is small, a small hole is sufficient. This statement and the following reason for it are given by Oliver Bowles in Bulletin 160 of the Bureau of Mines.

Suppose that a series of open seams parallel the quarry face and are spaced 10, 20, and 30 feet, respectively, from the face, as shown in figure 1. An average burden of churn-drill holes is 18 to 25 feet. If, in this instance, churn-drill holes are placed 18 feet from the face, what will be the effect of the shot on the masses designated a_1 to a_6, between the face and seam *1*? It is a well-known fact that an open seam acts as a cushion and almost or entirely checks the shattering effect of an explosion. The masses b_1 to b_6, between seams *1* and *2* would without doubt be shattered normally, as the drill holes are situated in these masses. However, the masses a_1 to a_6, protected by the open seam *1*, would not be shattered much and would merely be pushed out. If the drill holes were placed 25 feet from the face, they would be in the masses c_1 to c_7, and obviously the masses designated a_1 to a_6 and b_1 to b_6 would receive little of the shattering effect. A blast of this type, which pushes out great blocks weighing many tons each, would be very inefficient, as an excessive amount of secondary blasting would be necessary.

Therefore, in order to effectively shatter rock intersected by open joints, such as are represented in figure 1, at least one drill hole in each individual mass seems to be necessary. Moreover, the hole should be so placed that the shot is balanced, thus promoting equal effectiveness in all directions from the hole. Holes drilled in the

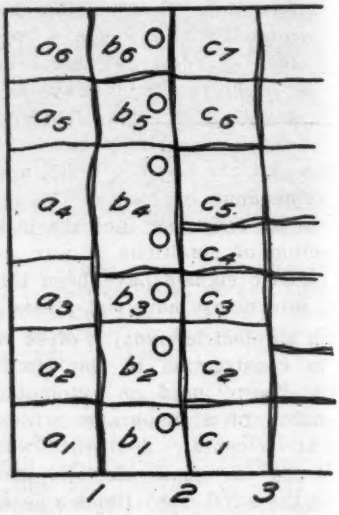


Fig. 1

masses designated a_1 to a_6 should be nearer to seam *1* than to the face, for the rock near the open face offers less resistance to the explosive force than that near the earth-filled seams at the back. The proper position of the hole can not be stated arbitrarily; it depends on the character of the rock, and can be determined only by experiment. However, on the assumption that the proper position is 7 feet from the face and 3 feet from the seam, it is obvious that a churn-drill hole 7 feet from the face would be too large. The small amount of explosive necessary to break

a mass 10 by 12 feet or 10 by 15 feet in area could be placed in a hole much smaller than that ordinarily made with a churn drill. Consequently, drilling a large hole in such a position would be a waste of time and labor.

For seamy rock one of the smaller types of drills is to be preferred, and the tripod is commonly employed. Thus multiple-bench quarrying may be the best method to use in unsound rock. When churn drills are used in rock having steeply inclined open seams, the drill bit tends to follow the seam and thus make further drilling difficult or impossible. This involves long delays, and may necessitate the abandonment of partly completed holes. Instances have been noted where many feet of drilling are wasted in this manner every month. Some quarrymen claim that this difficulty is less pronounced with tripod drills. For those skilled in the use of churn drills, however, the difficulty is no greater than where tripods are used. A small charge of explosive is sometimes used in straightening a drill hole that crosses an inclined open seam. Some operators drop pieces of scrap iron in the hole to delay drilling until the undesirable shoulder is cut away.

Sand for Optical Glass

Investigations, conducted during the war, to find the best sources of pure silica sand for the manufacture of optical glass resulted in the discovery of a sand that is said to be equal to any so far reported in the literature. This deposit is located at Rockwood, Michigan, and is being worked by the Rockwood Silica Co. It is stated that under careful supervision it was possible to obtain carload lots which averaged 0.015 per cent iron oxide, and some analyses as low as 0.004 have been reported. Glass sand for optical glass was also obtained from Ottawa, Ill., and Hancock, Md. Analyses of the best sand from these deposits averaged about 0.02 per cent iron oxide.

Wants State to Produce Materials

But Legislative Committee Also Says That Prices Represent New Level and Will Not Decline

IN ITS formal report to the general assembly of Illinois, the joint legislative investigating committee states a very positive conclusion that existing prices will not decline materially; that these prices express a new and substantially permanent level upon which present and future business must be conducted, and recommends to the public that building projects be not delayed in the hope prices will be lower.

But the report carries a recommendation that the state own and operate road-building material plants in order that the public may be protected "from extortionate charges for road-building materials."

"The recommendation does not seem to be consistent with the conclusion previously stated that present prices represent a permanent level from which they cannot be expected to decline," says Ben Stone of the Illinois Sand and Gravel Producers Association. "It is rather difficult to understand the viewpoint of some of our representatives as regards the desirability of having the state manufacture materials entering into public improvements, especially when, after so thorough an investigation as has been conducted by Senator Dailey's committee, there is nothing to indicate that the prices of such materials are in any way higher than conditions justify.

"Surely it is not the idea that the state can employ labor or purchase equipment, which are the two principal items of cost in the production of most road-building materials, at a lower rate than the concerns now engaged in these lines of industry?"

New Phosphate Plants in Tennessee

Conditions in This Branch of the Industry Are Showing Decided Gains

GOVERNMENT reports from Mt. Pleasant, Tenn., regarding phosphate rock, state that while railroad statistics are not at hand, the inquiry for unsold rock indicate that the requirements of phosphate rock for the manufacture of fertilizer, acid phosphate, etc., have considerably increased since last fall; and the general impression is that with a reduction in the price of sulphuric acid there will be a large demand.

During the month of April, there were local announcements of two new phosphate enterprises, namely, The Tennessee Agricultural Chemical Co., which has taken over the operations of the old Volunteer Phosphate Co., near Centerville; and the Columbia Chemical Co., which has purchased a tract of about 80 acres of land on the Pulaski pike near Columbia. Reports are that the latter company is just beginning to construct a 3-mile railroad connection to the L. & N. line, and proposes to erect plants immediately. The company at Centerville now has one grinding mill in operation, purchased with the property, and is planning to add two more.

The Armour Fertilizer Works has recently completed and started to operate an extensive washer plant on its McKennon property in the Century field. The Ruhm Phosphate Mining Co. has just completed the rebuilding of both its washer and grinder plants, and in so doing has doubled its former output capacity.

All of the ground rock available up to the middle of April was shipped as rapidly as it could be produced and loaded. The usual dull season then set in. This will, no doubt, continue until about July 15, or until after the Illinois harvest. In the meantime grinding continues, and the material is being stored for the fall season, since most buyers desire their shipments for direct application between July 15 and November 1.

This condition makes it impossible to fill all ground rock requirements, as the shipping season always finds a more or less serious car shortage, and an inability to handle even from storage the amount that could be sold. Efforts are being made to remedy this situation in Illinois by the establishment, by agricultural associations, of storage facilities in different communites, and by shipping to these throughout the year, the material to be removed by the farmers when they are in a position to use it. If this arrangement can be effected it should mean an increase in the demand for ground rock for direct application to the soil. At present the production and shipping facilities are insufficient to fill all requirements, and there is little or no chance to attempt even the introduction of raw ground rock into new fields.

Labor is more plentiful than during the past year, but there has been no reduction in wages from those paid during the war. Just at present, between seasons, the demand for rock is being supplied, and material is being stored for later consumption, but it is doubtful whether labor conditions will be such as to insure a sufficient supply to be stored to meet the summer and fall demand.

In the Florida phosphate industry, one of the factors of first importance is the shipping situation. The export business showed a marked increase during April, as compared with March, but it is still comparatively quiet as few bottoms are available, and the price for these is high. The export

business is continuous generally throughout the year, and is not seasonal. It is, moreover, usually carried on in raw rock, which is stocked abroad and converted into acid phosphate as it is needed. This year more than usual acid phosphate is going abroad, because Europe has not had time to manufacture her normal requirements, owing to the war. A big demand for export rock is anticipated after the peace treaty is signed, as the soils of Europe are badly in need of this fertilizer material.

Getting Jammed Blocks From Crusher

Provision Must Be Made for This, So That There Need Be No Delay in Operation

BLOCKS of stone often jam in the crusher mouth, particularly at gyratory crushers. If adequate facilities for removing such blocks are not provided, much time and labor may be wasted.

Attempts to loosen jammed blocks with a bar or a sledge may so delay the crusher that other related operations, particularly transportation, may be temporarily suspended. Hence it is wise to equip rock-crushing plants with mechanical devices, such as rope tackle or pneumatic hoist, each of which renders efficient service for removing jammed blocks.

With such equipment, delays of one-half to three-quarters of an hour by the employment of old-time methods may be reduced to delays of two or three minutes duration only.

F. Levy and L. and G. S. Carpenter, 322 Madison Street, Brooklyn, N. Y., have incorporated the Monolith Washed Sand and Gravel Company, of New York. Active capital $110,000.

Increasing Cement Output in Argentina

International Company Getting Onto Efficient and Remunerative Basis

THE plant of the International Portland Cement Company in Argentina has been showing a gradual increase in production. Costs have been reduced considerably of late, one important factor being the lower coal costs. The first shipment of coal to the plant cost the company $58 a ton. The last shipment cost $25 a ton. Early in February shipments were running about 1,000 barrels a day, with an increase to around 1,400 barrels daily the latter part of March.

The practical difficulty in placing the cement on the market lately was the high freight rates prevailing in Argentina. Cement could be shipped from New York in normal times at a cost for freight rates of $4 a ton, or 80 cents a barrel. Satisfactory arrangements have been made, however, with the Southern Railway in Argentine, for a relatively low freight rate, not only on the product of the plant, but on the coal sent up from Buenos Aires as well. The present price of Portland cement in Buenos Aires is around $15 gold per barrel. La Epocha a Buenos Aires paper, in a recent account of the property predicts an ultimate output of 1,000,000 barrels annually; and, indeed, there is no country, perhaps, in the world where there is so great a demand for cement, there being no gravel to make roads, little timber for building purposes, and enormous public works in process of construction.

The Roanoke Lime Company, of Roanoke, Va., has been incorporated by James D. Johnston and John Izard, both of Roanoke. Capital, $20,000.

Quarry of Woodville Lime Products Company, with New Crusher Plant at Left.

Big Lime Mill Also Producing Stone

Woodville Company Now Has New Crushing Plant in Successful Operation—Many Advantages in Diversity of Product

A lime plant naturally has to have a quarry. And having a quarry, it might just as well speed up its quarry capacity somewhat, and sell some of the rock in other forms, as to convert it all into prepared lime of the various commercial varieties.

There are times, for instance, when the market on limes of all kinds is "off" and a quarry would suffer an almost complete shut-down if it were not possible to hustle out and pick up a few orders for railroad ballast, concrete aggregate, or for meeting demands in other lines which use large quantities of limestone in its raw state.

Then again, every shot in the quarry brings down a large amount of small stuff which cannot be burned in the kilns and yet which can be screened and marketed to good advantage as road material or in the making of concrete.

But one of the main advantages of a well organized stone producing plant in connection with a lime plant, as worked out by the Woodville Lime Products Company of Toledo, at its big plant at Woodville, Ohio, is that there is always a plentiful supply of stone to keep the kilns running to capacity as long as there is a demand for their output.

This plant is recognized as one of the big lime producing units of the country. For a dozen years or more it has been operating more than forty kilns, with a hydrated lime business requiring four 3½ ton Clyde hydrators, and keeping seven Bates valve bagging machines busy putting the product into marketable form.

But lime is a product of fluctuating demand, and the number of kilns kept in operation must necessarily vary accordingly; so that with the mill as the only outlet for the quarry product, it was found an increasingly difficult task, as labor became scarcer and more "fussy," to adjust the quarry crew to the needs of the mill.

Round House and Machine Shop in Center, Drills Working in Distance at Right

These considerations, coupled with the increasing demand for stone in highway and other construction work in Ohio, led the company to start about a year ago the building of a complete plant for the production of commercial stone. This plant is now in successful operation, with a capacity of from 60 to 70 cars of stone per day, thus giving a good account of itself on the monthly balance sheet of the company, as well as keeping a sufficient supply of stone for the lime kilns at all times.

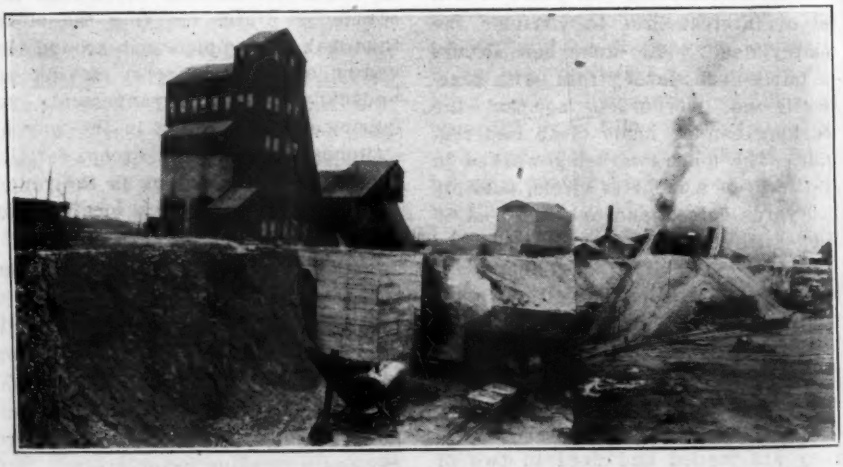
Before describing the plant it will be of interest first to consider the quarry itself. The stone here occurs in fairly even, level strata, with practically no overburden, so that the working can be made clean and regular. The quarry is being worked in the form of a monster circle, possibly 300 yards across, and to a depth of 60 feet, with cleanly cut vertical walls. Three Cyclone drills are kept busy most of the time drilling new holes to increase the diameter of the quarry. Two lines of holes are drilled around the quarry, except at the points where the crusher plant and incline are located, and when more stone is needed they are loaded and fired in two or three shots, the quarry boss not caring to risk the chance of an earthquake by firing all the holes at one time. Pieces of stone too large to be loaded onto the cars are drilled with pop drills and blasted, air for the drills being piped to the quarry from the general power plant.

A striking feature of this quarry is that it uses an unusually small trackage for the amount of stone handled. The track employed makes a complete circle of the quarry, just far enough from the face to allow room for the steam shovels which load the cars. The trains carrying the stone thus make a complete trip around the quarry at each delivery, making an unusually simple arrangement, requiring almost nothing in the way of switches and turnouts, except for the transfer of rolling stock to the round house and machine shops located near the center of the quarry floor.

Three steam shovels take out the rock after it is shot down and load it into Western dump cars. For hauling these trains to the hopper leading to the crusher and elevator, the company has two 10-horsepower Davenport steam locomotives and two Plymouth gasoline locomotives.

View of Crusher House from Hydrating Plant

To make the place conform to the Company's ideas of quarry neatness, three or four men and two one-horse wagons are constantly employed in keeping the quarry floor cleared of scattered stone. In addition to giving the place a better appearance, this freedom from scattered rock makes easier the moving of track and other work of the quarry. These wagons actually gather up and deliver enough stone to make their employment profitable aside from the feature of neatness for which they are primarily employed. They deliver to the crusher or to the area covered by a shovel.



Note Here the Concrete Bins Holding Large Stone for the Lime Plant

The initial crushing unit is located 40 feet below the quarry floor. It is a Superior jaw crusher of 48x60 inch size, and delivers to a 48-inch pan conveyor which carries the stone up 125 feet to a 6x12-foot scalping screen with 7-inch round holes. The oversize from this screen falls back into two reinforced concrete bins whose feet rest on the quarry floor, forming the supply for the lime kilns. From these it is drawn off as needed into V-shaped Koppel cars running under the bins. These are drawn by horses to the foot of the incline leading to the kilns, where they are hooked onto the hoist cable.

The material which passes the scalping screen is carried to 32x72-inch Garfield crushing rolls, thence by a 42-inch pan conveyor 107 feet in length into two five-foot by 26-inch revolving screens. Further reduction in size as desired is accomplished by running through a 36-inch Symons disc crusher.

The plant is electrically operated, current for the purpose being purchased from the Lake Shore Electric Railway, on which the plant is located. Several Westinghouse motors are used. The two large crushers are operated with rope drive, and other equipment with leather belting.

As will be noted from the illustrations, the crushing and screening plant is housed in a building of reinforced concrete foundations, with superstructure of corrugated iron siding and roof on a fabricated steel frame.

To secure right-of-way to its plant, a Michigan concern found it necessary to purchase a tract of ground overlaid with about 15 feet of very fine sand. This sand was considered of no value; but an investigation of it was nevertheless made, with the discovery that it was unusually uniform and satisfactory for use in asphalt work. As a result, contracts were made which call for from two to five cars a day of this material.

How to Apply Ten Cent Reduction

Evidence of Exemption from War Tax Accepted as Authority for Application of Rates

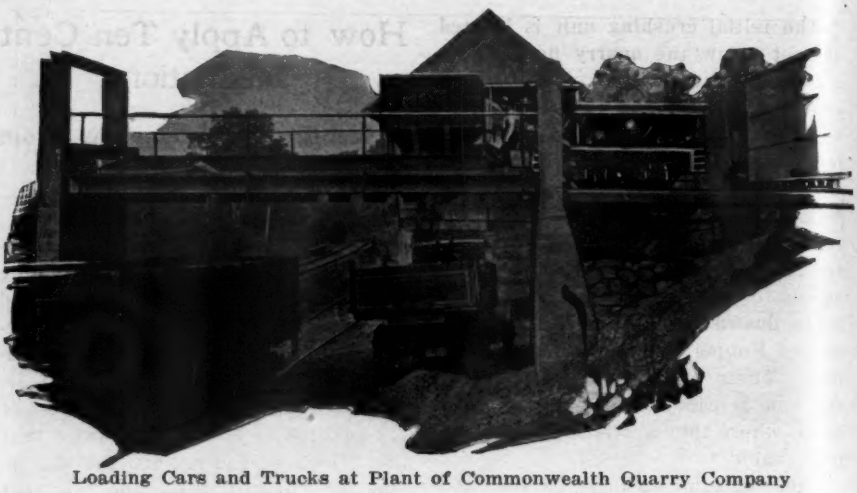
THE application of the ten cent reduction in rate on road-building materials allowed by the United States Railroad Administration in Circular No. 9 has been somewhat clarified by a more recent circular, No. 10, in which C. A. Prouty, director of the division of accounting, states that the evidence required for the exemption of charges from the war tax should be accepted as authority of application for the reduced rates. The circular is dated May 8 and is in full as follows:

Circular No. 9, issued over the signature of the Director of Traffic, dated April 14, prescribes rates on carload shipments of stone (broken, crushed and ground), slag, shells, chatts, chert, sand and gravel shipped during the period from May 1 to December 31, 1919, inclusive, when for use in road building or road maintenance, and when consigned to and the freight thereon is paid by Federal, State, County, Parish, Township or Municipal Governments.

These shipments should be waybilled at tariff rates, and to avoid unnecessary correspondence in connection with and the filing and adjusting of claims for refunds, Federal auditors shall issue instructions so that in the collection of charges on such traffic only the reduced rates as prescribed in this circular will be applied. The evidence required for the exemption of charges from the war tax should be accepted as authority for the application of the reduced rates.

Waybills covering this traffic may be reported by agents on the basis of reduced rates, but if interline waybills are not so reported, the instructions in General Orders Nos. 21 and 55 and Accounting Circular No. 76, applicable in such cases, should be followed.

This will be of some help in putting



Loading Cars and Trucks at Plant of Commonwealth Quarry Company

this rate into effect, but it would still further simplify the matter if the contractor or shipper might be permitted to pay the freight charges for the governmental subdivision for whom the work is being done.

The Railroad Administration has, however, promised in general that there will be an efficient handling of the ten cent reduction, and the general disposition of freight offices is to be reasonably liberal in the application of this rate.

There seems to be at the present time absolutely no probability of the general reduction in rates, the general thought of the Railroad Administration being rather in the other direction.

Prof. W. F. Pate, of North Carolina state university, reported at the Knoxville lime conference that in his state it has been found that lime on peat soil is very beneficial for the raising of corn, frequent and light applications being best. Two tons per acre will give just as good results as five tons, he says. If the cost of application is not a factor to be considered, he recommends one ton each year rather than two tons every other year.

In union is strength. Join your association.

Cars and Trucks Loaded From Same Platform

This and Industrial Locomotive Simplify Operations at a New Jersey Plant

THE method of loading used by the Commonwealth Quarry Company of Springfield, New Jersey, is shown in the accompanying illustration.

It will be seen that the loading of both motor trucks and railroad cars is accomplished from the same loading platform, which is a simple platform suspended from two concrete abutments.

The dump cars are brought from the quarry onto the loading platform by a Plymouth locomotive, the company operating two of these locomotives at the quarry, each one of which has replaced eight men previously required to do the same work.

The illustration shows the locomotive moving a car of 5-ton capacity. The owners have, however, substituted a 7-ton car, so that its large motor trucks can be filled at one trip.

Gravel Plant Uses Oil for Fuel

Saving in Several Different Ways Is Effected by Its Use by a Michigan Gravel Producer

HERE is a concern which is saving from $18.00 to $20.00 a day, just because it substituted oil for coal as the source of power for its plant.

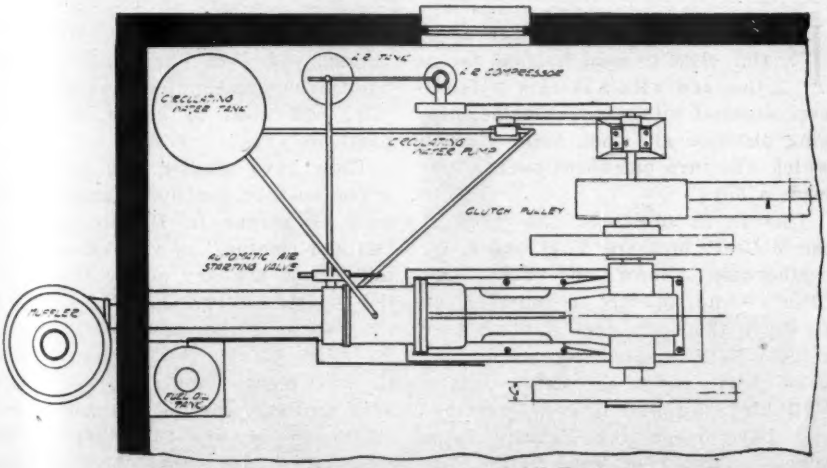
This is the Tecumseh Gravel Company, at Tecumseh, Mich. It has a plant which, as will be seen from the illustration, is of the Dull type, and operated for some time on steam power. But coal became during the war increasingly higher in price and more uncertain of delivery, so that shortly before the signing of the armistice the plant was changed over to equipment for the use of fuel oil.

For this purpose two Primm oil engines were installed. These are manufactured by the Power Manufacturing Company, Marion, Ohio, and are both of 100-horsepower capacity. One of them is installed in the main power station to operate the screens and crusher, while the other is in a separate building and supplies power for the Lidgerwood hoist which operates the drag-line excavator.

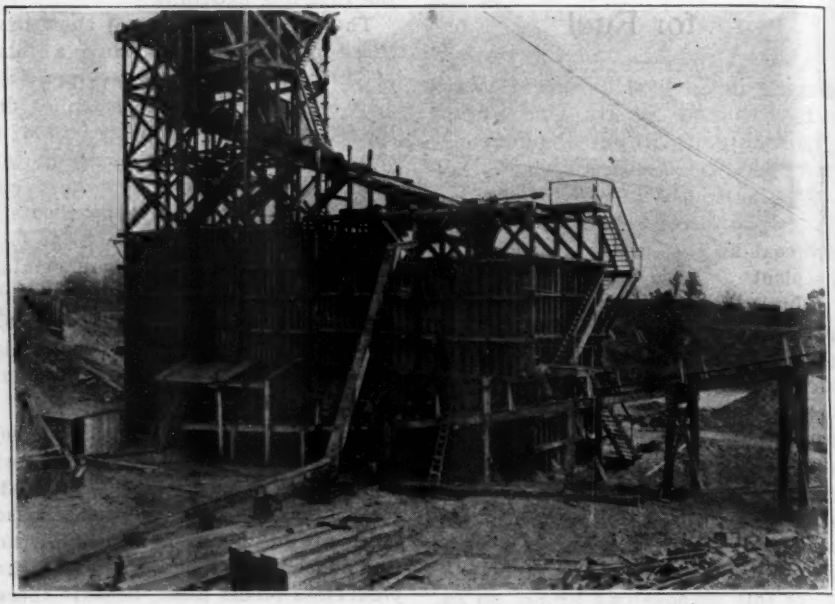
The records of the plant show that these two engines consume a total of 120 gallons of oil or less per day. This oil costs 4½ cents per gallon delivered at the plant, and is stored in two 7,000-gallon tanks buried in the ground, so that if any shortage is anticipated a supply for approximately four months could be secured at one time. A supply of coal for a similar period would be about 350 tons, which would be out of the question so far as storage is concerned, and would tie up approximately twice the amount of capital.

In addition to the saving on the fuel bill, the oil engine decreases the cost of operation because of the little attention which it requires, and because there are no ashes to dispose of, no coal to shovel. It also increases the production of the plant, because there are no waits in the morning to get up steam and get the plant into operation.

The equipment of this plant includes also a Marion shovel for stripping, a Davenport locomotive, a 100-ton Buffalo track scale, and No. 4 Austin crusher.



Plan Showing Arrangement of Oil Engine



Plant of McGrath Sand and Gravel Company at Mackinaw, Ill.

Standardized Sand and Gravel Plants

Two New Units in an Important Illinois Group Controlled by McGrath Brothers of Lincoln

FIND a deposit of first-class material, close to good railroad facilities, and with a market of fairly even demand within a reasonable shipping distance, and then build a plant which will turn out about twenty carloads a day.

This is, in substance, the creed of the McGrath brothers, T. H. and J. W. —otherwise known as "Ted" and "Jim" — who operate a number of plants in the north central district of Illinois, with headquarters at Lincoln. They work under the name of the McGrath Sand and Gravel Company, and have made this family name almost a household word in the districts where their plants are located. There is McGrath Station, McGrath's siding, and even the small boy, of whom you inquire the way, will say: "Oh, you want to go to McGrath's plant, do you?"

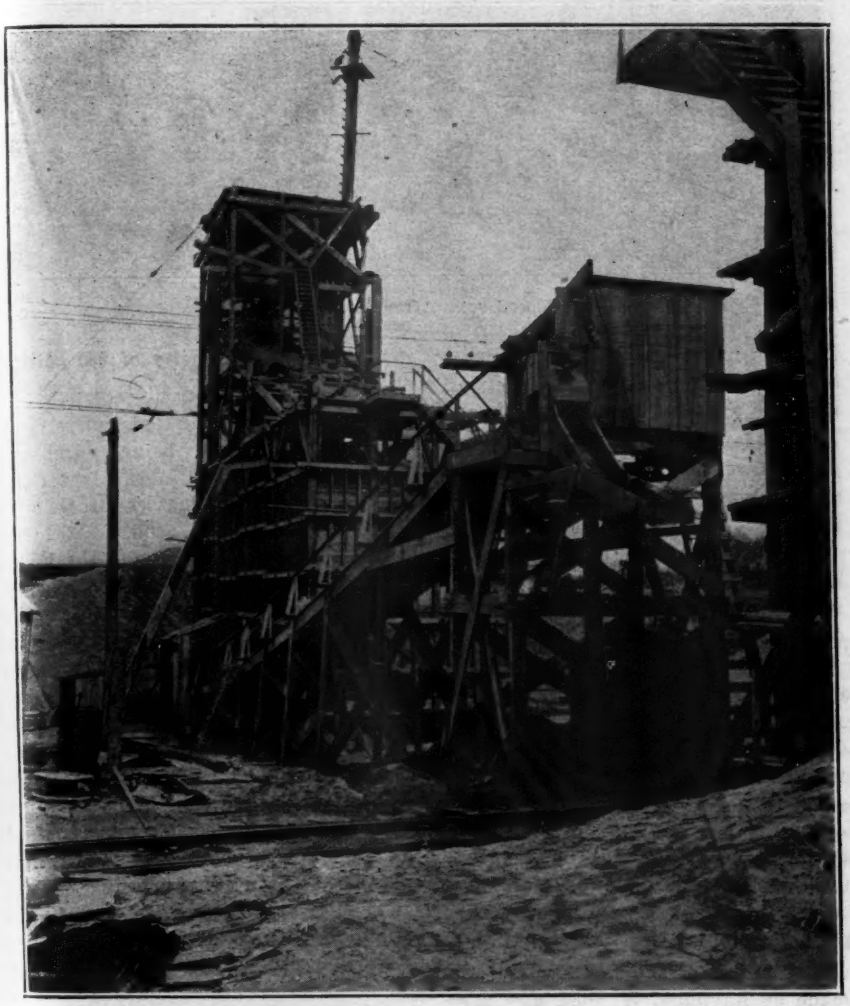
They have studied the sand and gravel business perhaps to as good purpose as anyone in Illinois, and are "up and coming," as you will soon be told if you ask any of the fellows in the Illinois association. The result of their study is the creed quoted above. To be on the safe side they have built the two plants shown in this article with provision for the addition of another set of screens, thus doubling the capacity, if such should be found desirable; but they are fully convinced

Three Views
of the
Pekin Plant

All Bins Deliver to Belt Conveyor

that the plants as at present equipped will give them all the capacity necessary, with occasional night work at the height of the season in order to take care of the peak load. So it is very likely that future plants of this group —and you may be sure that there will be future plants, for these men are young and ambitious yet—will have the screens set over the middle of the bins, instead of off to one side so that others might be added, and will be considered complete when first built.

Very likely the upward and arbitrary tendency of freight rates has had some influence in bringing them to this determination; and then, too, the little privately owned sand pit, which turns out "just sand," is springing up in Illinois far too numerously, with its attendant evils of inferior and nonuniform quality and uncertain de-



Where Conveyor Delivers to Cars

livery, and it is worth while to render a dependable supply available at as many points as possible.

The two plants here shown are at Mackinaw and Pekin, Ill., the latter having been in service for about a year, while the Mackinaw plant is a new one and is just being tuned up for production on a commercial scale.

Another article of the McGrath creed is to get a good design and stick to it, so that these plants are in most respects practical counterparts of each other. And for this, as in other things, these men are able to give a good reason for the faith that is in them. They argue that with plants designed similarly, the work of operation will be simplified, both on their own part and the part of their men. For themselves, they will be thinking in the same terms when working out plant prob-

One Man Looks After All the Chutes

lems, no matter what plant it may be that is uppermost in mind. They will not have to stop and think: "Yes, that is the plant with the rotary screens and the wooden bins," for they are all of that type. By having them of similar design and equal capacity they are also able to keep records on a more uniform basis, and are given a better standard by which to gauge the efficiency of different crews of men.

Again, men can be transferred from one plan to another as need arises without loss in efficiency, for they will be working under conditions with which they are fully familiar. So too, a capable foreman who has shown himself to possess ability, can be sent out to construct a new plant, and an efficient workman at any of the plants who is in line for advancement can be promoted to his place.

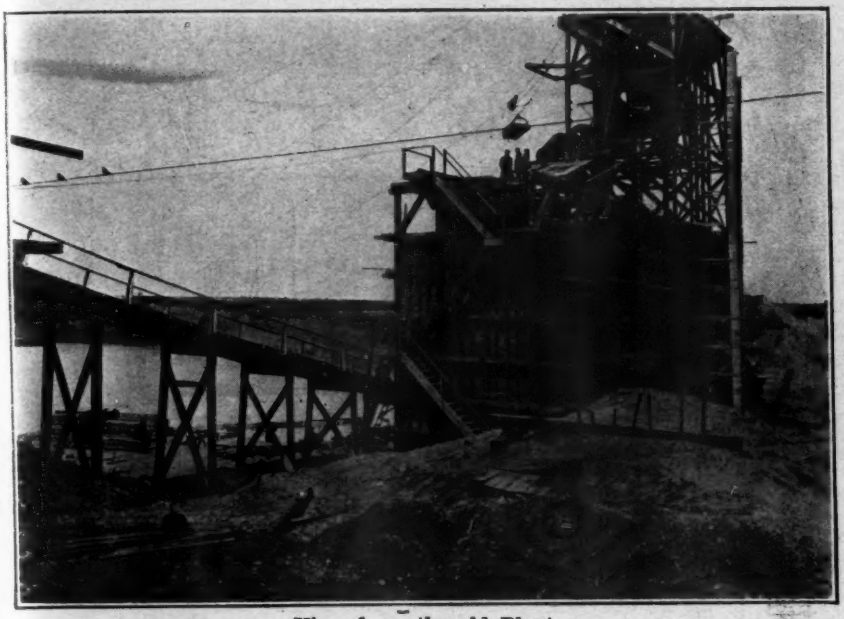
The design of the Pekin plant was made by Raymond W. Dull, now associated with the Link-Belt Company, and is equipped with three Dull conical screens, together with washing system and two 72-inch conical sand separators. Sand is delivered to the hopper above the screens by a Sauerman 1½ yard bucket operated by a 500-foot Sauerman cableway. This cable is controlled by a Thomas hoist, situated in a building by itself, and so located that the movements of the bucket are plainly visible. Water is supplied by a pump of the American Well Works type, having a capacity of 750 gallons per minute.

The plant is operated entirely by electricity, current being purchased from the Central Illinois Light Company. Individual motors of General Electric design are used, in the following units: for operating the hoist, 150 horsepower; for pumping, 35 horsepower; for revolving the screens, 30 horsepower. Lights are provided so that work may be prosecuted at night if conditions demand it.

This plant is surrounded by 60 acres of ground underlaid with a good, clean grade of sand and gravel. It is close to the surface, so that little stripping is necessary; but such as is required is done with a Maney four-wheel scraper. The deposit is being worked to a depth of 45 feet. The material is such that there is no large gravel requiring crushing; at the same time it is so well graded that it meets commercial requirements almost perfectly, and there has been no loss because of an excess of fine material which could not be marketed.

The plant is unusually fortunate in its location with respect to transportation, being on the Peoria and Pekin Union Railroad, a belt line which gives it direct access to eleven railroads.

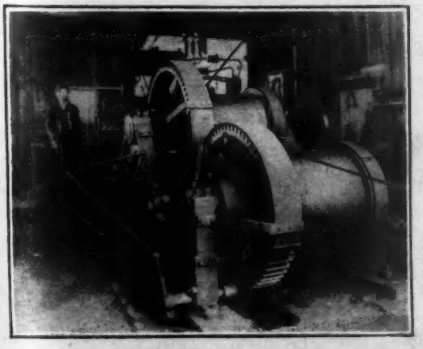
The new plant at Mackinaw takes the place of an old plant at the same point which had outlived its usefulness as well as having nearly exhaust-



View from the old Plant

ed the amount of good material within economical reach. It is, as before noted, a practical counterpart of the Pekin plant, except that here the innovation has been tried of having the material delivered to the cars by belt conveyor.

There were two reasons for this experiment: one was to avoid a relocation of the railroad track leading up to the plant; but a more compelling cause was the fact that there is a continual tendency to insist on a greater variety of gradation in the material as delivered. The belt used is a 20-inch U. S. Rubber belt of the Supremo brand. As will be seen from the illustrations, it runs under all the spouts leading from the bins. An experienced man can thus so regulate his gates as to deposit on the belt a mixture of material in just the proportions required. In addition to these advantages, there is also the possibility of more rapid loading, consequently a greater plant capacity.



Thomas Hoist at Pekin Plant

The material is excavated and delivered to the screens by a 1½-yard Sauerman dragline cableway excavator.

A No. 5 Austin gyratory crusher has been set up at this plant, but so far no use has been found for it, as the material practically all passes the screens.

At this plant there is about 6 feet of stripping, which is done with a Thew automatic steam shovel and dump wagons.

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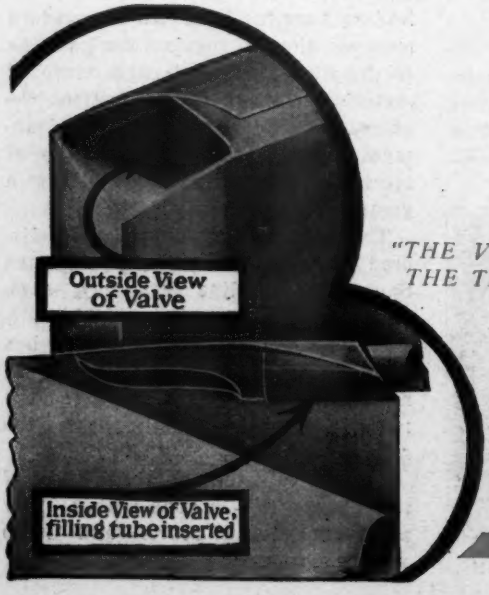

"THE VALVE'S THE THING"

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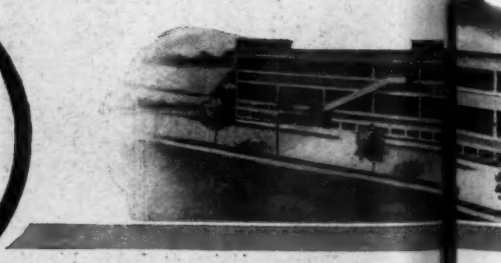

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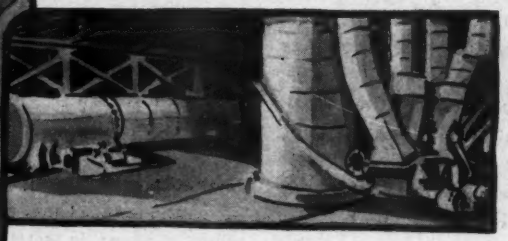

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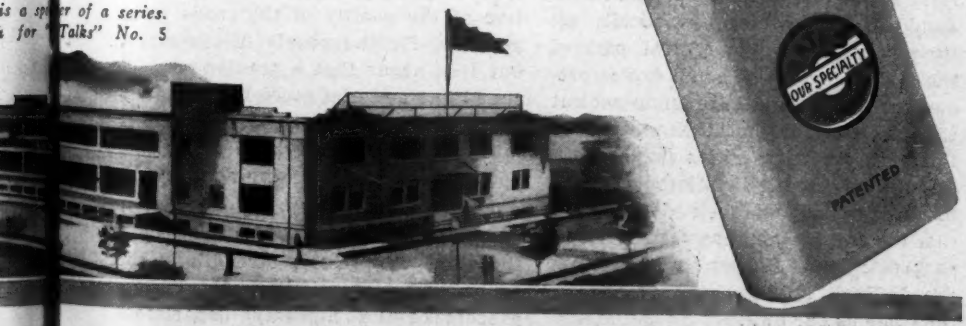

What Shall We Do With The Sand?

By D. S. BROWN

President Peoria Washed Sand and Gravel Company, Peoria, Ill.

SPECIFICATIONS are, of course, not made to fit certain materials, but to accomplish certain results. Road building in Illinois is carried on, not to furnish a market for the output of my own plant and others like it, but to equip the state with a system of highways which shall be a permanent benefit to the whole people.

But if the interests of the state and the interests of the producer can be made to coincide and focus at a common point, then, other things being equal, the people will get their roads at the greatest economy.

What I have specifically in mind, as many of my fellow producers will have already guessed, are the Illinois specifications regarding the grading of aggregates for concrete roads. Very likely other states are working under similar handicaps, but our company is working only in Illinois, so that this is the only set of specifications which concerns us personally.

It does seem to me that our Illinois specifications go to the extreme in cutting down the amount of sand to be used in concrete roads. And here is what the result will be: as soon as we are called upon to deliver road material in any considerable quantities (and by "we" I mean practically all the producers in the central part of the state), there will be an excess production of fine sand in order to get out enough gravel to meet the specifications. Some other states may be differently situated with reference to the natural grading of their deposits, so that the surplusage of sand may not be so great; but I happen to know that the Indiana product runs practically the same as our own.

This excess of fine material cannot be disposed of in such large quantities through the ordinary commercial channels, for the market is simply not sufficient to absorb it. A car of fine sand goes a long way in plastering work, especially with the present hesitancy in the building field; but this same car of sand is of very rapid production when a plant is getting out material for Illinois roads.

All of which means that this excess which has to be wasted must necessarily be charged up against the material which is sold to the state. It is not itemized that way in the bill which is rendered to the state; but if the operator is working on an efficient basis and expects to pay his bills and have enough money in the bank to build a new plant when the present one has to be thrown onto the scrap pile, it is in there just the same. It is a by-product which has cost us money to produce, but which cannot be made to pay for itself, however great our merchandising skill, for the market is simply not there; and so the cost of production must necessarily be added to the cost of the main product.

I am not for a moment arguing that the state should change its requirements to suit our production, irrespective of the quality of the roads to be provided for the people of the state; but I do argue that a greater percentage of fine material could be used without in the least jeopardizing the public interest, at the same time giving the people more roads for their money.

This may require a slightly greater amount of cement in order to produce the same compressive strength in the concrete; but even if it should, the engineers of the highway department

will, I am sure, be able to work out a combination of materials which will be economical all around.

Prof. Duff A. Abrams of Lewis Institute, Chicago, has just issued a bulletin entitled "Design of Concrete Mixtures," containing tables and diagrams for the combination of materials of different fineness to secure the same resultant strength of concrete.

It is also worth while to mention that Prof. Abrams has carried on experiments which prove conclusively that the amount of water in the mix has as great an influence on the resulting strength as any other one factor; and this is something which is scarcely given a thought by many engineers and contractors.

Demurrage Rules Are Changed

New Provisions More Favorable to Pit and Quarry Operators

THE standard code of demurrage rules has been changed, as a result of a series of conferences on the subject between a committee representing the National Industrial Traffic League and the Car Service Department of the Railroad Administration.

It has been agreed that the present rates will be replaced by rates of $2.00 a day for the first four chargeable days after 48 hours free time allowance, and $5.00 for each subsequent day.

It has also been decided to restore the average agreement on outbound cars, which application was cancelled as a wartime measure.

When the new arrangement is put in, there will be two agreements, one to apply on inbound cars and the other outbound; shippers will not be permitted, however, to offset debits against inbound cars with credits earned on outbound, or vice versa.

Much Depends On Size of Crusher

Lack of Efficiency Often Result of Using Machine Too Small in Size

THE size of the crusher used directly affects the labor required, not only for the actual crushing but also for other branches of quarry work. A prolific source of wasted effort is the use of a small crusher for rock loaded with a powerful steam shovel. The attempt is commonly made to substitute steam shovels for hand loading and yet retain the small crushers usually employed for rock loaded by hand. Such a combination of a massive loading apparatus with a small crusher has a twofold effect on the labor requirement, says a bulletin of the Bureau of Mines.

In the first place, much labor may be required to force the large rock fragments into the crusher. At one quarry a No. 9 gyratory crusher is employed to handle rock loaded with a No. 60 Marion steam shovel. Four men were employed to force the rock fragments into the crusher, and the total output averaged only 400 tons a day. Obviously, the rock could be handled with greater facility and with fewer movements by a crusher having a wide mouth.

In the second place, the use of a small crusher increases the labor required for handling the rock in the quarry. With a large crusher, blocks of the full capacity of the steam-shovel dipper can be loaded, but if the crusher had a narrow opening all large blocks of stone must be reduced to convenient size. Such blocks must consequently be shattered ahead of the steam shovel or be set aside and blasted.

With steam-shovel loading, therefore, large crushers are of distinct advantage in conserving labor.

Pit and Quarry

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WITHOUT seeming to express any political opinion by making any comparisons between the new congress and the old, we can at least say that the new one is different. Possibly it will be more inclined to give the country some needed appropriations—like the one for the proper upkeep of the railroads, for instance—a matter which ought not to be obliged to depend upon the idiosyncracies of legislators. That is, if it is still to retain control of the railroads.

ABOUT the middle of May, Ben Stone of the Illinois Sand and Gravel Producers Association reported that he expected the first of June to find every producer in the state running full time and with large orders ahead. Production has been stimulated largely by the starting of actual road-making activities in the state, and will be prosecuted to meet the needs of contractors, in spite of the uncertainty of labor. Mr. Stone reports that in some plants common labor is demanding 60 cents an hour for an eight-hour day, with time and a half for overtime and double price for Saturday afternoons and holidays.

CULTIVATE friendly relations with the freight departments with whom you have to deal. The chief of the department may be a grouch, or he may have the mistaken idea that you are in business simply to supply material for the railroad to haul; the clerks under him may be incompetent, and very likely are—but you can get along better with them, usually, by working with them as human beings rather than rearing up on your hind legs and demanding your rights—"or by the eternals we'll get your job away from you," etc. Sometimes such drastic measures are necessary, but not often.

HOUSING is going to furnish an enlarging subject of thought for pit and quarry operators. Heretofore labor at such plants has looked out for itself in this respect, or with an occasional rude shack built on company land. But the labor situation is bringing people to a realization of the value of giving a little more thought to the proper and comfortable housing of employes. A good man is worth keeping, even at some considerable expense, for in any event it would cost something to break a new man into his place, and there would be a decrease of production, and perhaps accidents to machinery, during the process. The working man is insisting on more of the accessories of civilized living; and if these can be furnished to him within reason, his tenure of service is sure to be longer—and if he is at all appreciative he will also be a better and more reliable workman as well.

That Job Is Finished

THE Victory loan has been put over —the last one of a notable series. We perhaps do not realize the bigness of the work we have done in our phenomenal financing of a phenomenal enterprise. Our perspective may be distorted now, and only time can show the events of today in their right relations.

But this much is worth taking into account: That the last war bond is subscribed; that in practically everything we are getting back onto a peace basis; that the banks may now feel free to use their funds for the financing of legitimate and useful commercial enterprises and public works, without feeling that they must hold back in order not to jeopardize the success of a government loan, or other war-time enterprise.

This one thing alone will have a stimulating effect on general investments and development work. There will, we are sure, be no reckless wasting of money in foolish enterprises following the period of restraint which has been imposed upon us; but it is surely to be hoped that capital will rapidly return to its normal channels of productivity, and there would seem to be now no reason why it might not legitimately do so.

BUSINESS was perfectly willing to subordinate itself to the dictates of officialdom at Washington during the exigencies of war; for it realized that only in this way could the war be prosecuted with most telling effect. But war is no longer the business of the nation, and the control of commerce should return with all speed to those who have made it a life study and know how to handle it. There have recently been notable steps taken in this direction—not, it must be admitted, with the utmost willingness on the part of the government representatives, but nevertheless the end has been accomplished, so nothing more need be said. But the big question still remains to be settled—that of the railroads. It is a question which bids fair to remain with us when industry has otherwise had an opportunity to forget the war and resume its accustomed ways. But with all our discussion of this problem it would help to clarify the situation immensely if we might keep in mind this fact: that the ultimate railroad policy of the nation will be in great measure the product of the men who were formerly in control of these roads. They are the men who know railroading better than any others; and the sooner they can be placed back on the job the better.

Let's Not Worry

THE Bureau of Mines, through its monthly bulletin, calls attention to the possible competition which the development of artificial aggregates for concrete will offer to the producers of natural aggregates.

But the danger would seem to be more apparent than real. Artificial aggregates, made from burned clay or shale, have been developed because of their light weight, rather than to compete with other materials, and will be used to any extent only where the normal weight of ordinary concrete is a disadvantage, such as in the construction of concrete ships. Perhaps its use may extend to the floors of concrete buildings, where the resulting saving in materials due to the lighter weight of the aggregate will compensate for the increased cost of the manufactured over the natural product.

For there would seem to be little probability that a product which has to go through several processes, including burning, could ever be sold so that it could compete with sand, gravel and stone on price alone.

Let Him Do It!

THE commercial producer of agricultural lime has no occasion to look with disfavor on the farmer who puts in a little pulverizer of his own and grinds a few tons for his own use. The history of the majority of such cases seems to be that these private plants merely stimulate a demand for the commercial product. A farmer sometimes buys a machine on the supposition that he can do grinding for his neighbors in addition to producing for himself, and thus make the machine pay for itself at least, if not indeed making something of a profit for him; but farm neighborliness is a peculiar and unstable thing to bank upon, and some of these men have found that their neighbors, after seeing the good effects of lime treatment, much prefer to haul their lime from town.

Some dealers who originally combatted the farmer-owned pulverizer are now "strong for it," to quote the exact words of one of them. He says each new one in his territory brings him some additional customers. For the entire agricultural lime industry is, after all, in its educational stage, and every new user becomes the best kind of a promoter, because he can talk from actual experience, which is the best basis for a sales talk.

And the farmer does talk. A manufacturer in any line who discovers a new process to speed up production will usually want to keep it "under his hat" so that he can by this much reap a benefit over his competitors. But the farmer insists on talking about what he is doing. And indeed he could scarcely be secretive if he desired; for it is not possible to hide from public view the treatment of broad acres with fertilizer—while the results of such treatment will also speak for themselves in the increased yield which the farmer is only too glad to exhibit and talk about.

Keep It Up!

IN spite of the fact that some of the men at the Knoxville conference reported that the advantages of agricultural lime are so well known as to need no salesmanship behind it, the general experience is to the contrary. There are long months of promotional work yet to be done before the use of lime will become as general as it should be; so it behooves the manufacturers to keep up the educational propaganda which alone can put this thing across. The seed thus sown will sprout eventually. Whatever one may think regarding the wave of prohibition sweeping over the country, all are practically agreed that it is the result of the temperance evangelism which has been carried on for more than a generation. Some of us are old enough to remember when the cause was exceedingly unpopular, and there were many besides rum sellers and cynics who were willing to concede that national prohibition was a purely utopian dream. But now it is very nearly an accomplished fact, thanks to the educator, the exhorter, the crusader, the spell-binder, if you please. Call him what you will now, you cannot hurt his feelings—for he has the glow of triumph on his face.

The Luckey Lime and Stone Company, of Luckey, Ohio, capitalized at $500,000, has been incorporated by Henry A. Herkel and others.

P. P. Hamilton, representing the Ohio Valley Sand and Gravel Company, of Brillion, Ohio, is looking over the ground at Belmont Park, near Moundsville, W. Va., where a large sand plant is now being installed at a cost of approximately $50,000.

The Electric Sand and Gravel Company, now being organized by Waco, Tex., citizens as a successor to the Waco Sand and Gravel Company, will run a modern, electrically operated plant, which will more than double the present capacity.

Cement Makers Form Export Company

Ten Eastern Concerns Have Organized for Foreign Business Under the Webb Law

TEN Portland cement manufacturers, having an aggregate productive capacty of 14,000,000 barrels annually, have joined in the organization of the Cement Export Company, Inc., a Delaware corporation, registered under the Webb act, for the purpose of exporting cement. Invitations to participate in the new organization have been extended to all eastern manufacturers, and it is expected additional companies will join in the near future.

The following were elected directors of the Cement Export Company: Emil Loeb, Coplay Cement Manufacturing Company; Joseph Brobston, Dexter Portland Cement Company; J. A. Horner, Nazareth Cement Company; L. C. Morton, Phoenix Cement Company; George F. Bayle, Glens Falls Portland Cement Company; J. W. Fuller, Allentown Portland Cement Company; Frank H. Smith, Lawrence Cement Company; Charles F. Conn, Giant Portland Cement Company; Morris Kind, Hercules Cement Corporation, and F. W. Kelley, Helderburg Cement Company.

The principal office of the company will be in New York.

Gilbert H. Montague, attorney, directed the organization and prepared the form of contract signed by the various participating companies. Arrangements are under negotiation with the Bureau of Standards to test all cement delivered by the export company and to certify that the cement fulfils all the requirements of the standard specifications of the American Society for Testing Materials.

The plan provides that companies now exporting under their own label may continue to do so, if desired. All cement delivered by the export company, however, will be shipped under the label of the export company.

As Portland cement for domestic shipments is almost entirely delivered in paper or cotton sacks and as most export shipments are called for in wooden barrels, the matter of cooperage is of great importance. Tentative plans have been outlined for the erection of a barrel manufacturing plant at tidewater, with a large storage warehouse equipped with barrel-packing machinery in connection therewith. By having a large stock of cement in storage at tidewater at all times it is believed better advantage can be taken of the somewhat limited shipping facilities now exitsing to South American countries. While it is the expectation of the Cement Export Company that its activities will be confined largely to Latin-American countries, it will be in a position to supply cement in European countries if conditions make this desirable.

Consideration has been given to the construction of concrete ships of large capacity to take care of the growing demands for Portland cement of American manufacture.

The Texas Sand and Gravel Company is a new firm now engaged in installing machinery to screen and wash sand and gravel at Wichita Falls, Tex. The capacity of the new plant is stated to be 200 cubic yards a day. E. L. McAlbee is the manager of the new concern.

In the operations of a quarry in Pennsylvania an explosion of dynamite threw a rock one and one-half squares distant through a window and injured a woman in a dwelling. Such a violent and unusual result amounts in itself to evidence from which a jury might infer a lack of proper care in the amount of explosive used for the blast.

ASSOCIATION ACTIVITIES

Lime Convention Comes This Month

Reservations Already Made for Big Gathering in Pittsburgh June 18 and 19

RESERVATIONS at the William Penn Hotel, in Pittsburgh, for the meeting of the Lime Association, June 18 and 19, are rapidly being made, and the present indications point towards a representative attendance from all parts of the country.

The program for the convention is rapidly assuming shape and it is believed will present a number of features of great advantage to the lime industry.

"In many respects the program will differ materially from programs of the annual meetings of the National Lime Manufacturers' Association," says Robert F. Hall, general manager, "in that the work the association has done, and the problems confronting it which have assumed definite shape during the past year, will be laid before the membership. The organization of the association staff is practically completed. The work to be done during the next year is definitely mapped out. The lime industry is awakening to the importance of its mission in the United States and the possibilities for the improvement of trade conditions, for the development of the demand for lime in its several fields and for closer mutual understanding and coöperation among manufacturers will form an important part of the program of the meeting."

One of the important questions which is sure to come up for discussion is that of compensation insurance. Several experts on this topic will be present at the convention, and members of the association who have had considerable experience in dealing with compensation insurance will also give some valuable data.

The investigation of the use of chemical lime is also bringing to the association information which shows that one of the greatest obstacles in the way of the development of chemical lime is the present method of shipment of this product.

In nearly every industry which uses chemical lump lime, the reverted carbonate is not only so much inert material for which good money has been paid for production, profit and freight, but it represents a further loss due to the expense of handling it through the processes of manufacture into which it enters. It is, to say the least, wasteful to continue burning lime and permit it to revert to carbonate due to careless packing. Lime manufacturers in general have thought that an air-tight container for lump lime would be a fancy and expensive luxury, owing to the fact that they did not realize how cheaply air-tight containers could be produced.

It is expected that there will be on exhibition at the Pittsburgh convention a full size sample of an air-tight container that has proven to be a commercial success. Figures will also be presented showing the cost of manufacture of these containers on a quantity basis and other data to prove the advantages of this package.

Those who attend are requested to reserve Wednesday evening, June 18, for an evening session. Several speakers who have interesting and instruc-

tive messages to deliver will address the association during the dinner. It is assumed that all members will dine that evening; and to save time which would otherwise be lost, it is proposed that they dine collectively instead of at random. The dinner will be simple and strictly informal and will be served to members at cost.

The nominating committee has already completed its work and has submitted to the membership its report covering the nominations of officers and directors for the ensuing year.

Non-members as well as members are invited to attend this convention of the Lime Association. The general manager announces that they will be entirely welcome and that their presence is desired. They will, of course, have no right to vote or participate in the deliberations, and will not be admitted to executive sessions. Otherwise, they will be admitted without discrimination.

One of the things to be shown at this meeting will be some of the tangible results of the Chemical Bureau, outlining some of the work which it has done in securing definite information regarding the proper use of lime and new uses to which it might be applied.

Safety Problems Discussed by Cement Men

A meeting for the discussion of safety problems at the various cement plants of the Oglesby district was held in La Salle, Ill., early in May.

The session was called by the Portland Cement Association Bureau of Accident Prevention and Insurance, of which Mr. Jacobson is manager.

About eighty-five delegates attended the meeting. These include men from the Lehigh plant, the Marquette, the La Salle, the Universal plant at Buffington, Ind., the Dixon plant of the Sandusky company, and the Hannibal, Mo., plant of the Atlas company.

Lime Association will Have Chicago Office

Committee Appointed to Procure Necessary Funds—Detail of Budget to Be Prepared

THE Lime Association has decided to establish a district office of the association in Chicago, effective July 1st, with specialists on agricultural, chemical and construction lime attached to the staff. This step was determined upon at the meeting of the Mid-West district held in Chicago on May 7th.

In order to secure the necessary funds special dues will be assessed in the districts affected by the program, and with this purpose in view a committee was appointed to work out the details. The committee consists of Henry Angel, of the Kelley Island Lime and Transport Company, R. C. Brown of the Union Lime Company, B. L. McNulty, of the Mitchell Lime Company; G. J. Nicholson, of the White Marble Lime Company, and B. F. Pay of Fowler & Pay, assisted by the general manager of the association.

A plan of the budget of the Mid-West district and full details of the operations proposed for the next fiscal year will be speedily prepared and submitted to the manufacturers.

The Williamsport Wire Rope Company announces that after long marketing its product in the Chicago territory through other channels, it has now opened its own warehouses at 753-55 West Quincy Street, Chicago. A complete stock of every size and design of rope made by the company will be carried here at all times. The warehouses, together with the branch office at 122 South Michigan Avenue, are under the management of Mr. C. H. Ballard.

Agricultural Lime Creed Adopted

Result of Deliberations of a Conference Held at Knoxville, Tenn.

A NUMBER of men who are interested in the use of agricultural lime got together at Knoxville, Tenn., a short time ago and canvassed the situation pretty thoroughly with reference to the increased use of this product.

At the close of their deliberations the following resolutions were drawn up and adopted:

1. *Lime Needs of the Southeastern States.*

The agreement is unanimous that the soils of the Southeastern States are seriously deficient in lime, so that liming is essential to their most profitable development and permanent improvement.

2. *Suitable Materials.*

Suitable Agricultural Lime materials are High Calcium, Magnesian and Dolomitic Limestone; also high-grade Oyster Shells and Marl, together with the burnt products (or the chemical equivalence of such) of any of these in the amounts hereafter recommended by this Conference.

3. *Fineness of Grinding.*

The finer the limestone is ground, the greater is its immediate availability. Limestone ground to pass through a ten mesh screen, all finer particles included, is recommended for the common application of two tons per acre. Either very finely pulverized limestone or burnt lime is recommended, where an application of only a few hundred pounds per acre is to be made.

4. *Quantity and Frequency of Application.*

For general use we recommend an application of 1 to 2 tons of ground limestone per acre, or one-half that amount of burnt lime, once in a rotation of not more than five years. For alfalfa and permanent pastures, an initial application of double these amounts should be made.

5. *Time of Application, Distribution and Mixing with the Soil.*

Lime may safely be used at any point in the ordinary farm rotation without serious loss of the material. If applied in connection with tilled crops, its mixture with the soil will be insured. The effects of lime are likely to be in proportion to the thoroughness with which it is mixed with the soil in which the crop roots develop.

6. *Liming and Crop Rotation.*

Liming is most profitable in those rotations in which legumes are prominent; but, over large areas in these States, especially on the heavier types of soil, liming is profitable for corn, small grains and grasses.

7. *Lime and Fertilizers.*

With soils poor in potash and phosphate, liming gives best results only when supplemented by materials carrying these constituents.

Steps were taken to have other conferences of this nature at the call of the chairman.

Ohio Silica Men to Visit Illinois

Likely to Hold a Joint Meeting of Two Associations in Near Future

A VERY enthusiastic meeting of the Illinois Silica Sand Association was held early in May at the organization rooms at Ottawa. L. R. Farrell of the Portage Silica Sand Company of Cleveland, Ohio; Dr. A. T. Howland of the Geauga Silica Sand Company of Cleveland, and T. B. Ely of the Venango Sand Company, three members of the American Sand Association, were in Ottawa to attend the meeting.

These three gentlemen spoke, telling of the business conditions at the present time in the east and of association work as they have experienced it. It was suggested that the members of the two associations hold a joint meeting in the near future at some convenient city between Ottawa and Cleveland This meeting will probably be arranged within the next few weeks.

Indiana Association Gets Expert

R. C. Yeoman Leaves College Work to Devote His Time to This Organization

R. C. YEOMAN, the well known gravel road export, and recently head of the Highway Extension School of Civil Engineering, of Purdue University, and traveling extension workers for good roads in Indiana, has been appointed extension engineer of the Indiana Sand and Gravel Producers' Association, and consulting engineer of the National Association of Sand and Gravel Producers.

Mr. Yeoman's experience as head of the extension school of the university makes him a very valuable man for the work of the association, which will include the promotion of the uses of sand and gravel in every possible legitimate way, and by reason of his connection with the national association, as consulting engineer, sand and gravel producers will have the benefit of the work he is undertaking.

Mr. Yeoman is a graduate of the Purdue University; he was assistant instructor in the civil engineering and testing laboratory at this university, and was also professor of civil engineering at Valparaiso University, and later dean of engineering there. He is a director of the American Association of Engineers and has done some very important work both as designing engineer and superintendent of construction of the Knox sewer system, as well as inspector of concrete roads in Canada for the Portland Cement Association.

Producers Sand and Gravel Company, Cleveland, Ohio, capital $50,000, recently incorporated. Directors: Charles H. Miller, Carl H. Miller, Walter W. Geiger, W. C. McCullough and E. J. Hart.

Higher Rates or Greater Freight Volume?

Can We Have Both? If Not, Which Shall It Be? Asks Illinois Association

THIS is a topic which is discussed in a recent weekly bulletin of the Illinois Sand and Gravel Producers Association. It says: "It is daily becoming more obvious that there is not the slightest inclination on the part of any big traffic men now in power, to deal with the slack tonnage situation as would have been done a few years ago, when it was the custom to reduce rates on basic commodities in order to encourage heavier movements.

"It would be remembered that in 1914, when there was a falling off in business generally, the railroads proposed a 5 per cent advance in rates, presumably on the theory that the volume of traffic would not be less

"Before the advance became operative, the world war was on and freight traffic increased by leaps and bounds, so that we did not have a fair test of the actual effect on business of the increase in freight rates. Nevertheless, our railroad traffic officials are thoroughly imbued with the idea that to increase revenues they must have higher rates rather than greater volume of traffic, and it is apparent to every man who reads and thinks these days, that the real test of such policy has yet to be made."

Paul T. Vittur, of Ottawa, Ill., secretary of the Illinois Silica Sand Association, figured in a hold up in Chicago recently, when he was approached by three armed men who ordered him to "hold up his hands and keep them up' and then proceeded to relieve him of about $10 in cash, his watch and fountain pen.

New Orleans Producers Explain Prices

Sand and Gravel Men Tell Mayor's Investigating Committee Why Costs Are High

IN New Orleans the mayor has followed the lead of other localities and has had an investigating committee looking into the prices of building materials.

M. H. Goldstein, president of the New Orleans chapter of the American Institute of Architects, told the committee that his city is paying more for gravel than any other large city in the country.

But the committee was informed by representatives of three large sand and gravel corporations that these concerns are either losing money or making very little profits even at the present rate.

Regarding the hearing the *New Orleans Item* says:

Mr. Goldstein quoted market reports showing that gravel in Denver costs $1.60 a yard in carload lots; in Chicago $2, in Kansas City $2.50, in Dallas $2.25, in St. Paul $1.25, in San Francisco $1.15, in Boston $1.60, in Los Angeles $1.02, in Atlanta $2.40.

In New Orleans the price quoted by Mr. Goldstein was $2.75, or 25 cents a yard higher than in any other city. Walter Jahncke, representing the Jahncke interests, however, said that the price is really $2.61, including the discount given for cash payments.

By the time this gravel gets to the job, where the builder may use it, according to Mr. Goldstein's figures, it is sold at $4 a yard. Mr. Jahncke again corrected the quotation which he said is now $3.75, or $3.56 counting the discount for cash.

Sand also came into the day's discussion. New Orleans prices at the cars are $2.55 a yard, Chicago sells at $2.25, New York at $2.25, Boston at $3, Memphis at $2.25 and St. Paul at $1.90.

Mr. Jahncke, when asked why the people of ew Orleans must pay more for sand than those in Memphis, said that local companies have a 20-mile tow, while those in Memphis haul their product only five miles; that Louisiana imposes a 5 cent a yard conservation tax on sand which the Tennesseeans do not pay; that local companies also pay canal tools of $30 to $40 a barge holding 200 yards of sand, and then pay an additional high rate in New Orleans. J. W. Thompson, president of the company hearing his name, corroborated Mr. Jahncke's statement, but said that he did not have to pay the canal and wharfage fees, so his production cost is less.

"Mr. Jahncke," questioned Mr. Goldstein, "why is your price the same as Mr. Thompson's when your cost of production is higher than his?"

"It's just like anything else," answered Mr. Jahncke, "if I sell sand at $1.50, I don't think he would charge $1.40."

Mr. Thompson interposed and said that he had sold practically no sand in New Orleans during the war.

"What I sell in New Orleans," he said, "I buy from Mr. Jahncke."

S. B. Coleman, representing the Acme Sand and Gravel company, announced that his price for sand was higher than that of the Jahncke corporation, because of the high freight rates.

A statement on pre-war and present prices and costs of production was then presented to the committee by Mr. Jahncke.

According to the statement, gravel sold at $1.85 a yard, f. o. b. cars, before the war, in New Orleans, and sand at $1.30; and that the present prices are: Gravel at $2.61 a yard and sand at $1.43. This represents an increase of 28.2 per cent. Comparative costs of production were said to represent an average of 68 per cent increase over those in the pre-war period.

When asked if prices on sand and gravel are likely to go down, Mr. Thompson said:

"If conditions settle, prices will go down. Until they do, especially as regards railroad facilities and freight rates, no."

Mr. Thompson then said his New Orleans sand business in January was done at a loss of 18 cents a yard, in February at a loss of 9 cents a yard and became a profit in March. Mr. Jahncke interposed by saying that the present prices on sand and gravel are relatively lower than those of other basic building materials. Mr. Coleman said he has found an increase of 74 per cent in the selling price of gravel

and 44.5 per cent in that of sand, but he would be delighted to return to old conditions which gave him a larger margin of profit.

The three sand and gravel dealers were unanimous in blaming discriminatory freight rates for a part of the high cost of their products in New Orleans. They also said it is almost impossible to obtain assurance of getting empty cars.

Favors Federal Highway Commission

U. S. Chamber of Commerce Puts Itself on Record at St. Louis Convention

THE national highway policy and plan of the Chicago Highway Congress was unanimously endorsed by the annual meeting of the Chamber of Commerce of the United States at St. Louis in May. Resolutions to the following effect were passed.

That highways are an integral part of our nation's system of transportation has been emphasized by the War and an enormous development is at hand. So important as to require a comprehensive National Policy under which Federal appropriation for highways will be applied to national needs for interstate commerce, agriculture, postal delivery, common defense and general welfare.

Congress should create a Federal Highway Commission independent of present departments of the government, composed of members from the different geographical sections of the country to perform all executive functions of the Federal Government pertaining to highways, including those relating to existing appropriations in aid of state construction. Such a commission should act in coordination with any federal agency that may have functions of articulating rail, trolley, water and highway transportation.

Congress should make substantial appropriations for the construction and maintenance of a National Highway System to serve the need for the maintenance of interstate travel and traffic.

The Commission should report to Congress a plan for continued aid for State construction of highways in the period beyond 1921 to which time the provision of existing Federal Aid laws extend.

Expenditure of funds should be permitted only for highways which are of permanent type, having thorough drainage, substantial foundations, sufficient width and a capacity for traffic which will be reasonably adequate for future needs.

The large number of commercial organizations throughout the entire country cooperating with the Highway Industries Associations foreshadowed such action by the National Chamber and increases the importance of the work of the Highway Industries Association and its value to the Federal Highway Council in the latter's leadership in the campaign for the national highway policy and plan calling for the creation of the Federal Highway Commission and the National System of Highways.

The Castalia Portland Cement Company is pushing the matter of the electrification of its power plant at Castalia, Ohio, and when this work is completed this firm will have one of the most up-to-date mills in the country. Motors will be installed in the different departments, capable of developing 2,000 horsepower. While it will take twelve months to complete the improvements the output of the factory will not be curtailed, work going on as usual.

A large sand pit, said to contain about 18,000,000 yards of sand, gravel and road building material, has been located near Monroe, La. J. E. and W. L. Morgan and H. M. Severance, of Monroe, will develop the new find.

The Wheeling Sand & Gravel Co. was recently incorporated at Wheeling, W. Va., and capitalized at $100,000, by R. W. Marshall and E. L. Fundis, of Wheeling; G. W. Leive and E. Aaron, of Warwood, and C. B. Upton, of Elm Grove, and will shortly engage in business in gravel and sand, and a general line of building supplies.

Death Claims Well Known Engineer

Captain Henry B. Sauerman, Prominent Chicago Citizen, and Authority in Engineering Affairs

CAPT. HENRY B. SAUERMAN, a prominent citizen of Chicago, and one of the organizers of the first company of army engineers in the state of Illinois, died at his home in Chicago on May 20th.

Captain Sauerman was born at Crown Point, Ind., April 7, 1879, coming to Chicago when quite a young man. He obtained his education at Chicago technical schools and the Michigan Military Acedemy, and then entered the employ of Fairbanks-Morse & Company, where he remained for eleven years, first as chief draughtsman and then as contracting engineer. In 1911, with his brother, John A Sauerman, he organized the firm of Sauerman Bros., engineers and manufacturers, succeeding the H. N. Elmer Company.

In August, 1911, Captain Sauerman enlisted as a private in the original Company A corps of engineers, I. N. G., and in July, 1912, was made Captain, remaining in command of the company until poor health compelled his retirement. This company was succeeded by the 108th regiment of engineers which only recently returned from France where they performed valiant service on the fighting front.

Captain Sauerman was a member of the American Society of Civil Engineers, Western Society of Engineers and Chicago Engineers Club. He was awarded the Octave Chanute medal in 1916 by the Western Society of Engineers for his paper, "Fortification,"

Capt. Henry B. Sauerman

which was later published as a handbook for army engineers.

He was a leading advocate of improved highways and his book entitled "Highways and Railways for the Defense of Our Nation," recently published, attracted wide attention and much favorable comment.

The Youngstown Sand and Gravel Company, has started work on their new plant on the old Hennion farm, West Pittsburgh, Pa. The present plant is running to capacity under the management of J. Huffman and will continue to do so until the new one is ready for operation.

The Great Lakes Sand Company, of Indianapolis, Ind., capital $10,000, has been incorporated by Charles J. Ruebling, Fred E. Lang and Albert G. Ziesk.

The Rubber City Sand and Gravel Company, of Akron, Ohio, capitalized at $100,000, has been incorporated by Hal G. Knight, G. F. Schnee, Frankie Russ, Charles Schnackel and John C. Grimm.

Greater Production of Calcareous Marl

Output in 1918 Shows Increase of 33 Per Cent, With 58 Per Cent Increase in Value

THE production of calcareous marl in 1918 was 98,694 short tons, valued at $261,082, according to reports made by producers to the United States Geological Survey, Department of the Interior, and compiled under the direction of G. F. Loughlin.

This industry has showed a marked increase during the last three years, production being as follows:

	Quantity (Short Tons)	Value	Average Price Per Ton
1916	58,088	$144,768	$2.32
1917	73,900	165,223	2.21
1918	98,694	261,082	2.65
Percentage of increase in 1918	33.6	58.0	20.0

In 1916 and 1917 the entire output was reported as used in agriculture. In 1918, 78,232 tons, valued at $203,500, was sold for use in agriculture, an increase of 4,332 tons (nearly 6 per cent) in quantity, and of $38,277 (23 per cent) in value. The remaining 20,462 tons, valued at $57,582, was sold for the neutralization of acid waters, for use in making prepared fertilizers and for other uses not specified.

Of the total marl produced 57,821 short tons, valued at $148,873, or $2.57 per ton, was fresh-water marl consisting mainly of small shells of fresh-water animals. It came from ten companies—six in Virginia, reporting a total output of 39,770 short tons valued at $100,518, and one each in Arkansas, New York, Pennsylvania and West Virginia.

The output of fresh-water marl in 1918 increased 21 per cent in quantity and 33 per cent in value compared with that in 1917, which was 47,914 short tons, valued at $112,075, or $2.35 a ton, produced by nine companies—three in Virginia, two in California and one each in New York, Pennsylvania, West Virginia and Arkansas. The operations in Virginia in 1918 were at Barber, Allegheny County; Daleville, Botetourt County; Marlbrook and Riverside, Rockbridge County; and at Claremont, Surrey County. Two new companies at Claremont report that shipments will be made in 1919. The plant at Caledonia, Livingston County, N. Y., which has been in operation for many years, was burned in 1917 and operations at the deposit have not been resumed, the marl sold in 1918 being material on hand. A new company started operations at Cassadaga, Chautauqua County, N. Y. A new plant has been erected and shipments are expected to begin in 1919. The Pennsylvania deposit is at Harmonsburg, Crawford County, and has been in operation three years. The West Virginia plant has been in operation two years and is at Charlestown, Jefferson County. No sales were reported in 1918 from the deposits near San Jose, Santa Clara County, and Lemon Cove, Tulare County, Calif. In Arkansas the material reported is chalk and the deposit is at White Cliff, Little River County.

Marine Marl, derived from fragments of the shells of marine animals, was produced in 1918 at five deposits in the Coastal Plain region of North Carolina and South Carolina. The output amounted to 40,873 short tons, valued at $112,209, or $2.75 per ton, compared with 25,986 tons, valued at $33,148, or $2.35 a ton, in 1917, an increase of 14,887 tons (36 per cent) in quantity, and $59,061 (111 per cent) in value. These deposits are near Charleston, S. C., and New Bern and Pollocksville, Jones County, N. C.

The Superior Sand and Gravel Company, of Richmond, Va., has been incorporated by Huntington and St. Albans parties for extensive operations at Clendenin.

Final Cement Figures for Last Year

Marked Decrease of Production, But Not Alarming in View of Conditions Existing During 1918

COMPLETE statistics of the output of hydraulic cement in 1918 compiled under the direction of Ernest F. Burchard, of the United States Geologcial Survey, Department of the Interior, indicate a marked decrease from the output in 1917 and show that the production of Portland and other cements in 1918 was the lowest since 1909. The final statistics of shipments, production, and stocks are about 1 per cent lower than those given in the Survey's preliminary estimate published in January.

The decrease in output was the effect of the war restrictions imposed by the Government upon fuel supplies, transportation facilities, labor, and private construction in general. The extent to which the cement industry in the several States and commercial districts suffered is indicated in the accompanying tabular statements.

The shipments of Portland cement in 1918 amounted to 70,915,508 barrels, vauled at $113,153,513, compared with 90,703,474 barrels, valued at $122,775,088, in 1917, a decrease in quantity of 21.8 per cent and in value of 7.8 per cent. The production in 1918 was 71,081,663 barrels, compared with 92,814,202 barrels in 1917, a decrease of 23.4 per cent. The stocks at the mills increased from 10,353,838 barrels in 1917 to 10,453,950 barrels in 1918, or 1 per cent.

The decrease in shipments and in production was general; it covered every State and commercial district and ranged from 8 to 40 per cent. According to the producers' reports about 54 per cent of the capacity of the cement-manufacturing plants of the country was utilized during 1918, but the capacity operated in the several States ranged from 38 to 70 per cent.

Two new plants produced Portland cement in 1918—the Old Mission, at San Juan de Bautista, Cal., and the Three Forks, at Hanover, Mont.—and six plants were idle during the year, one each in California, Kansas, Michigan, Nebraska, New Jersey, and New York. The total number of producing plants in 1918 was 114, and the total number of plants that shipped cement was 115.

The average factory price per barrel for Portland cement in bulk in the different States in 1918 ranged from $1.511 in Pennsylvania to $1.894 in Washington; in 1917 it ranged from $1.22 in the Lehigh district to $1.69 in Washington. The average factory price per barrel for the whole country was $1.596 in 1918, compared with $1.354 in 1917, an increase of 24.2 cents, or 17.9 per cent. The prices in these two war years are the highest that have been realized for Portland cement since 1898 and 1899, when they were respectively $1.62 and $1.43 a barrel. The lowest average price, $0.813, was recorded in 1909 and 1912.

The combined production of natural and puzzolan cements in 1918 was 432,966 barrels, valued at $401,341, compared with 639,456 barrels, valued at $435,370, in 1917, a decrease in quantity of 32.3 per cent and in value of 7.8 per cent.

The exports of hydraulic cement from the United States in 1918 were 2,252,446 barrels, valued at $5,912,166, or $2.62 per barrel, compared with 2,586,215 barrels, valued at $5,328,536, or $2.06 per barrel, in 1917. This represents a decrease in quantity of 12.9 per cent and an increase in value of 11 per cent. The imports for con-

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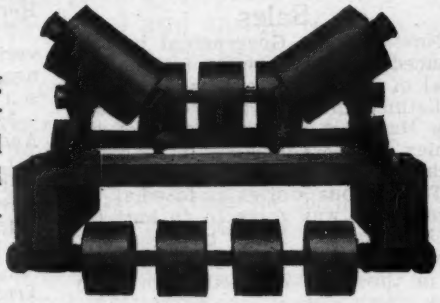
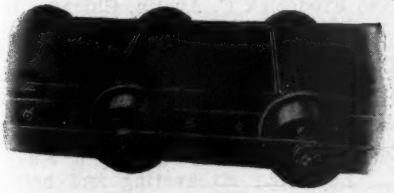
Simple in design, economical of power, they give satisfaction. Different styles to suit your requirements.

A rough sketch showing conditions to be met at your plant, with capacity desired and power available, will bring our recommendations.





APRON OR PAN CONVEYORS

Flights or pans made of steel or cast iron, fitted to steel bushed self-oiling roller chain — complete with drives.

SCREW CONVEYORS

Steel "HELICOID" or Sectional flight screw conveyor for washing plants. We also make cast iron Screw Conveyors.

See Catalogue No. 38 for complete line of

Elevating, Conveying and Power Transmitting Machinery

H. W. CALDWELL & SON COMPANY
CHICAGO
Western Avenue, 17th and 18th Streets

sumption in 1918 were 305 barrels, valued at $1,200, or $3.93 per barrel, compared with 2,323 barrels, valued at $6,076 or $2.62 per barrel, in 1917, representing a decrease in quantity of 86.9 per cent and in value of 80.3 per cent. The statistics of exports and imports were compiled from records of the Bureau of Foreign and Domestic Commerce, Department of Commerce.

Looks for Larger Truck Sales

"Now that the Government has announced a definite policy for the disposal of its surplus trucks, I look for a distinct increase in truck sales," says Harry M. Lee, president of the Duplex Truck Company of Lansing, Michigan.

"The various stories as to what the Government was going to do hurt the truck business. Many business men who were ready to buy trucks held off in the hope of getting an army truck cheap.

"Now that it has been decided that the surplus army trucks are to be used in road building and post office work and will not be offered to the public, I believe that the truck prospects who have been holding off will now purchase."

Thanks to the present state legislature, Indiana people now feel that they have an up-to-date highway law under which they shall be able to make progress. This new law gives the state a highway commission, something which Indiana has not previously had, and puts the state on a modern and efficient basis in every respect, so far as the development of its roads is concerned.

Tell Pit and Quarry about your failures and successes. We can help each other.

The Traylor Engineering and Manufacturing Company has just completed, at its shops in Allentown, Pa., the largest stone crusher in the world. This is a 60-inch Bulldog gyratory machine, and will be placed in the plant of the Michigan Limestone and Chemical Company at Rogers City, Mich. The crusher weighs about 400 tons.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20c each. State number of patent and name of inventor when ordering.

1,295,757. Gyratory crushing apparatus. Joseph E. Kennedy, New York, N. Y.

1,296,800. Dipper or bucket. Henry Herring, Kouts, Ind.

1,297,385. Rock crusher and pulverizer. Charles O. Michaelsen, Minneapolis, Minn., assignor to Michaelsen Machinery Co.

1,298,153. Stone-crusher. Peter C. Anderson, Racine, Wis.

1,298,188. Frame for jaw-crushers. William B. Easton, Chicago, Ill., and David Cole, El Paso, Tex.

1,298,340. Bucket. Lemuel J. Hatt, St. Louis, Mo.

1,298,978. Excavator-bucket cleaner. Truls Loken, Kenosha, Wis., assignor to Frederick C. Austin, Chicago, Ill.

1,299,212. Center and side dump car. John O. Neikirk, Lombard, Ill., assignor to Rodger Ballast Car Co.

1,299,905. Mining-machine. James A. Brantley, Sand Springs, Okla.

1,300,100. Rock-drilling machine. Gustaf Anderson, Stockholm, Sweden.

1,300,842. Excavating and hoisting apparatus. John Johnson, Tukwila, Wash.

1,301,121. Rock-drill. Thomas Gordan and Hugh W. Simpson, Parson's Bridge, Vancouver Island, Canada.

1,301,626. Grab-bucket. William E. Watters, Melrose Park, Ill.

1,301,803. Excavating machine. Harry J. Barnhart, Marion, Ohio, assignor to The Osgood Co., same place.

1,301,833. Trenching machine. Hendrik L. Geveke, Hilversum, Netherlands.

1,301,918. Excavator. Robert A. Denovan, Dalkeith, Ontario, Canada.

The intelligent use of lime means greater prosperity to the farmer and better crops, which in turn means to the whole population.

Some of the associations have a 100 per cent membership of all producers who are eligible. That's the way to co-operate.

Why Inclined Conical Screens ?

ECAUSE they are more efficient, economical and designed particularly for washing and grading gravel and sand. Their principle of operation is the reverse of that used in ordinary screening processes.

The gravel, sand and water are fed into the first screen together, and pass directly through the large holes into a flume underneath, with the exception of the largest sizes of stones, which are screened out and discharged through the small end of the cone into the first bin. The flume delivers into the next screen where the process is repeated for the next operation and so on through the desired number of separations.

This method provides the largest screening surface and heaviest screens where the coarsest material is handled, and makes it possible to use efficiently thin plates and small holes for separations of fine material at the end of series.

Each series of screens is mounted on a single long shaft, supported by bearings between the screens. The drive is simple—a pair of bevel or angle gears, applied at one end of the shaft.

The value of these features can be measured in greater efficiency, less power required, and lower maintenance expense.

We design and equip complete plants to meet your individual requirements. Let our engineers help you. Write for our Sand and Gravel Washing Book No. 17.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

Branch Offices in Principal Cities

We Also Make
Elevators and Conveyors.
Link-Belt and Sprockets.
Silent Chain Drives.
Buckets.
Electric Hoists.
Locomotive Cranes.
Wagon Loaders.
Screens.
Write for Catalogs

LINK-BELT
Sand and Gravel Plants

MEN AND MACHINERY

Hydro-Hoist

The cut shows the Hydro-Hoist mounted on 3½-ton chassis with combination body known as "Heil's 4 in 1 Type." The Hydro-Hoist allows the body to be placed just back of the cab, thereby utilizing all of the loading space and insuring the proper load distribution.

The Hydro-Hoist is a self-contained unit. The pump case and the oil ways form one of the rigid tie members of the hoist. The hoist consists of two vertical cylinders mounted on the chassis frame about in line with the front spring hanger of the rear spring. The two pistons are made of 2-inch double extra heavy pipe. As the distance between these pistons is approximately 18 inches the tendency of the body to twist when one rear wheel is lower than the other, when raising the body, is reduced to a minimum.

Heil's combination body is fitted with two sets of sides, double acting tail gate and manual tail gate control. The lower set of sides give the correct capacity for hauling gravel. The two sets of sides give the correct capacity for hauling coal.

The Heil Co., Milwaukee, Wis., has just issued a new catalog giving complete information on the Hydro-Hoist and full line of steel dump bodies which they shall be pleased to send on request.

New Service Department

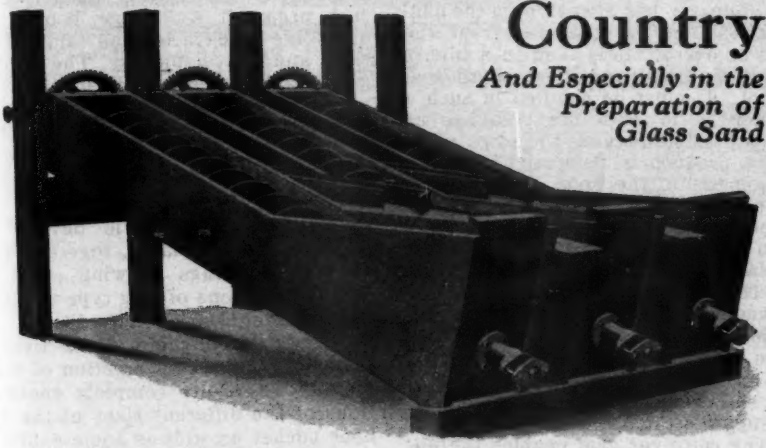
Operators of the Chalmers & Williams crushers, as well as purchasers of their other products, will appreciate the recent establishment by this company of a Service Department, under the supervision of Mr. J. F. Orr, sales-manager, and Mr. J. I. McInrue, field representative. The latter has practically grown up with the company and is thoroughly versed in all details of construction and operation of every machine, and is therefore in a position to render invaluable service to operators, where little difficulties may arise that are very easily overcome with an expert at hand to effect speedy adjustment.

Mr. McInrue will visit the various rock and gravel plants of the country, with the object in view of seeing the crushers in operation, and that they are operating to the highest point of efficiency possible. He will also acquaint the operators with the experiences the manufacturers have had in the construction of the machines, and desseminate any facts he may obtain in the field regarding the various crushers, and which may not be known to the manufacturer, as frequently changes and additions are made to a machine by an operator, which would not be thought of by the manufacturer.

Hydro-Hoist used with "Four in One" Body

Used in Some of the Largest Quarries in the Country

And Especially in the Preparation of Glass Sand



LEWISTOWN
Sand Washers

These are reasonably priced, well built, compact outfits, which can be easily and quickly installed. They are simple in construction and efficient in operation. Extensively used in the manufacture of glass sand which is so much needed today in the making of optical lenses for field glasses, telescopes, etc., required by the Government.

If you are not acquainted with Lewistown equipment and service, it will pay you to look into it.

We are in position to assist you solve your problem of whatever nature, if it pertains to crushing, grinding, screening, washing, drying and conveying, as we manufacture a full line of this machinery and equipment. Drop us a line stating what you desire information on.

Lewistown Fdy. & Machine Co.

LEWISTOWN, PENN.

Loader for Lime

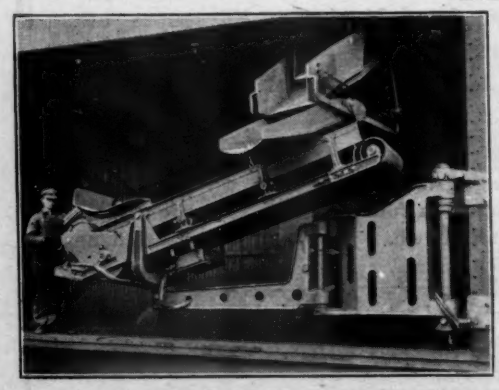
This is an illustration of a 24-inch Manierre belt loader and will be of especial interest to men in the lime field.

One of the vexing problems in the lime industry has always been the handling of lime as it comes from the kilns or ovens. It is then in a highly heated condition and must be allowed to cool. It must be handled in such a manner as to keep the breakage as low as possible because the sales value of the product is determined by the "wholeness" of the lime.

After the lime has cooled and been inspected, the core (underburnt lime) taken out, the product is at its highest standard of value and to get it loaded into box cars with the least possible breakage furnished the remaining problem.

The Manierre box car loader shown here has overcome this difficulty. The view shows clearly the general layout and suggests the operation of the loader. The conveyor arm enables the operator to start with the discharge close to the floor of the car and lift up gradually as the pile increases, thereby reducing breakage to a minimum. The motor is such that the speed may be varied to enable the operator to place the lime exactly where he wants it.

The Manierre loader is in daily operation at such well-known plants as the Knickerbocker Lime Co., Riverton Lime Co., The American Cyanamid Co., American Agriculture Chemical Co., Baugh Chemical Co., Hoover and Mason Phosphate Co. and International Agriculture Corp.



24 In. Belt Loader

Excavator Book Free

Mansfield Engineering Company, Indianapolis, Ind., designers and builders of slack-line excavating machinery and manufacturers of the Pioneer back-dump excavating bucket have just prepared a 32-page booklet on slack-line excavation as applied to sand and gravel plants. The booklet goes into the application of slack-line excavation as applied to such plants very thoroughly, and contains illustrations showing this type of equipment in actual use under different conditions.

Considerable space is devoted to complete gravel plants, together with working drawings showing some actual installations of this type of equipment under various conditions, together with complete stock lists of material required for erection of these plants. There are complete specifications of the different sizes of the Pioneer bucket as well as some cables of interest to the sand and gravel producer.

This booklet is for free distribution to sand and gravel producers.

New Publication

"Over 1,000 Scoop Conveyors" is the title of a 20-page folder just published by the Portable Machinery Co., Passaic, N. J. This folder is replete with illustrations showing the various uses of the scoop conveyor, describes clearly the labor, time and money saving features of the machine in storing, reclaiming, loading and unloading material such as coal, coke, ashes, sand, gravel, crushed stone, fertilizer, cement, chemicals, etc. Thirty-two letters from users are printed testifying to the merits of the machine and eighty-four letterheads representing additional concerns who have written commendatory letters are reproduced.

Copies of the folder will be sent gratis, to those interested, upon request to the manufacturers, the Portable Machinery Co., Passaic, N. J.